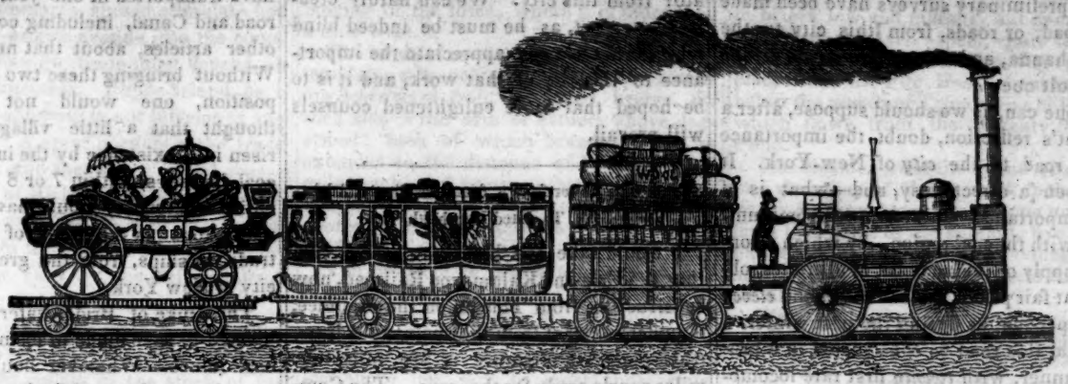

AMERICAN RAILROAD JOURNAL,

AND ADVOCATE OF INTERNAL IMPROVEMENTS.

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AMERICAN RAILROAD JOURNAL.

NEW-YORK, APRIL 23, 1836.

Errata.—In the article on a "New Instrument for measuring distances," &c., for "reaching of the smaller parts" read "reading of the smaller parts," p. 295, line 29 from bottom; and again, for "reaching" read "reading," line 17 from bottom.

These, and several other instances, in which we have been made to utter nonsense, will be excused, when our readers are reminded that eight pages of the Journal were thrown into Pi, and all the labor expended upon them, lost.

Leavenworth and Bloomington Railroad.—The route of this road from Indianapolis, via. Martinsville, Bloomington, Bedford, Orleans, and Paola to Leavenworth, has been surveyed by E. N. Elliott of Indiana College.

He has found the route to be in general favorable, but advises that the charter be so amended as to leave out Bedford as a point in the line.

With one exception no grade over 50 feet per mile will be adopted. The entire route is 129,09 miles.

"The construction recommended is the flat bar with a flange on the inner edge, laid on white oak string pieces let into the transverse sleepers and secured by a dovetail wedge; the iron to be two inches wide and half an inch thick with a triangular flange of half an inch deep and half an inch in width, slopes off at an angle of 45°, so as to make the inner edge of the bar one inch thick. The string pieces of the best white oak five inches by nine, supported at intervals of five feet by transverse sills eight feet long and not less than twelve inches thick, imbedded in the ground, and on embankments on soft ground, supported by longitudinal sills.

The estimate per mile for this superstructure is	$2,067 72
The cost of grading, &c. per mile, exclusive of a tunnel at Leavenworth, is	3,968 98

The total, including tunnel, &c. $913,622 59

An extension of the road to Lake Michigan is recommended as offering great advantages to the stockholders, and at the same time completing the line of communication through the State.

Jacksonville and Meredosia Illinois Railroad.—This Road is to extend from Jacksonville in Morgan County to Meredosia on the Illinois River, a distance of 26 miles. It passes, we are informed, through one of the most level, fertile and highly cultivated regions of the State. The capital is *one* hundred thousand, with the privilege of increasing it to *two* hundred thousand dollars. The company has four years to commence and eight years to complete the road. It is believed that the road will be ultimately continued across the State and connect with a road in Indiana, and finally reach the Lake or be connected with the New-York and Erie Railroad.

Any person owning lands in Morgan County may subscribe for stock, one share, at least, on every 40 acres, by giving a mortgage and paying 6 per cent. interest to the company, and the company may in turn raise money on these bonds and mortgages for the construction of the road.

From the uncommon favorable character of the county, it is believed that the entire work may be completed for $130,000.

The company is authorized to loan out any surplus money they may have at *twelve* per cent. interest, or any less rate as the Directors may determine.

Railroads leading from New-York.—We ask for the communications of "Clinton," number 4 of which is published in this number, an attentive perusal. They are from the pen of a gentleman of intelligence and character; one who looks at the great subject of internal improvement with the eye of an American—not as a man whose ideas extend only to the boundary of his immediate neighborhood, or State. He has studied the institutions of his country; understands well the character of the people, and the fertility of the soil of the vast region beyond the lakes, and equally well the present and *coming* wants of the citizens of this growing metropolis, the natural outlet for the rich fruits of the west, and would convince others, as he is convinced, of the importance of opening another avenue from this city to the interior of a rival State, an avenue which shall not only intercept a good share of the *Susquehannah* trade, but also pass through the Anthracite and near to the *bituminous*, coal region.

The preliminary surveys have been made for a road, or roads, from this city to the Susquehanna, and the route is by no means a difficult one.

No one can, as we should suppose, after a moment's reflection, doubt the importance of the road to the *city* of New-York. It will open a direct, easy, and—what is of more importance—uninterrupted communication with the coal region—by which a constant supply of fuel may be, at all times, obtained at fair prices, instead of *ten* and *eleven* dollars per ton, as during the past winter.

Should this road be constructed in a proper manner, with *twenty* first rate locomotive engines, *one thousand* tons of coal per day may be thrown into this market, should there *be*, or be a prospect of, a scarcity of fuel. This coal could be brought from the mines and delivered at the dwellings of the consumers, even in the winter, at not to exceed *seven*, and in summer at *six* dollars per ton—and it would always *ensure* a supply. Is it not, then, of immense importance to the city of New-York, as well as to New-Jersey, that this work should be made?

We have given the chief matter of interest, from the Report on the Eastern Railroad, by J. M. Fessenden, Esq.

We would direct attention to that gentleman's views as to the rail to be used, it being heavier, higher, and supported at greater intervals, than those generally in use.

ELIZABETHPORT AND SOMERVILLE RAILROAD, N. J.—We learn that the first three miles of this road is under contract, and that the workmen commenced operations several days since at Elizabethport, and it is expected that cars will run from the landing to Elizabethtown by the 4th of July next. This road passes through a rich and fertile section of country, and will meet the Delaware river at Easton, Pa.

MISSISSIPPI RAILROAD.—This railroad, as we learn from a gentleman on the line, is to extend from Natchez, through Gallatin and Jackson, to Canton, in Madison county—its length will exceed 150 miles. So earnest are its friends and stockholders in pushing it forward, that 7 miles of it were put under contract two months before the charter was obtained.

HARTFORD AND NEW-HAVEN RAILROAD.—The Commissioners of this Road have determined to adopt the route hitherto designated as the middle route through Meriden, Berlin, &c.

OLEAN CANAL.—We have been informed that there is some doubt as to the passage of this bill—and further, that one of its determined opposers is an Honorable Senator from this city. We can hardly credit the report, as he must be indeed blind who cannot see and appreciate the importance to this city of that work, and it is to be hoped that more enlightened counsels will prevail.

Extract of a Letter from a friend residing at Adrian, M. T., dated March 8th.

I would take the liberty to inform you, that the Erie and Kalamazoo Railroad, now constructing from Toledo, on the Maumee, is under contract from that point to Adrian, (this place,) a distance of 32¾ miles—20 miles nearly ready for the irons. The Company expect to have the line completed to this place for business the ensuing fall. This, considering the newness of the country, (only six years since its first settlement,) I think is accomplishing a great deal. The prosecution of the work thus far, has had the effect to increase the price of property from 50 to 100 per cent.

I am, with due respect,
Yours truly,
A. J. C.

To D. K. MINOR.

For the Railroad Journal.

CLINTON No. IV.

In the three preceding numbers I wrought hard to compress much matter in a small compass, *multum in parvo*, I believe the Latinists have it. My purpose in this paper is to expatiate somewhat broadly and leisurely; that is to say, instead of travelling thirty miles an hour, whisked along at the rate Lord Brougham was when he rode from Manchester to Liverpool; or darting forward like the streak of lightning in chase of the Kentuckian's horse; I mean to travel as whim or pleasure shall prompt, stopping by the way-side to gather a flower or pick up a pebble, as shall suit my fancy.

The enterprise of Mr. Wurts and his company in purchasing coal lands on the Lackawana, where Carbondale is now situated, and expending two millions and an half in making a Canal and Railroad to their mines, was a bold one, and has resulted successfully. Unfortunately for them, I think, they are working rather too near the outer edge of the coal basin, to get at the purest of their coal. Were they to extend their Railroad a few miles lower into the Valley of the Lackawana, they would be amply compensated for the expense in the increased depth and purity of the veins of coal. As they go deeper into the earth, even now, where they are, the coal becomes more pure. How many ships sail from New-York annually for Europe? It is barely a guess with me, for I have no book of reference. Are there 300? Do their average burden exceed 400 tons? Say so: 300+400=120,000. A hundred and twenty thousand tons! A vast amount, truly. But the Hudson and Delaware Company have transported in one year on their Railroad and Canal, including coal, lumber and other articles, about that number of tons! Without bringing these two facts in juxtaposition, one would not readily have thought that a little village, which has risen into existence by the influence of its coal deposites, within 7 or 8 years from an entire wilderness, should have exported as many tons as the whole of the European trade in ships, from the great commercial city of New York.

The Duke of Bridgewater, half starved himself to save funds to open a canal to his coal mines. Whatever doubts or sneers may have arisen while he prosecuted the work, no one now questions his wisdom If, reader, you have, without trouble, an opportunity to do so, please to cast your eye over the pieces of Railroad and Canal stock in Great Britain, and see at what very great, in some cases, what amazing advance there is on those which lead from coal districts. Will it not be so in our own country? By the last paper I have seen Schuylkill stock was up more than 200 per cent above par, i. e. 153½ for 50 paid, owing to the coal trade. The Lehi was at 89 for 50. Could this company disembarrass itself of the reserved right of the State, to purchase its stock, at par, whenever she should think fit, the shares would run up to 200 per cent. advance.

The proposed Railroad which I would press upon your notice, from New York to Pittston, in Luzern county, the very heart of the Anthracite coal basin is, as I before stated, only 106 miles, in an air line from the City Hall. The road, it is believed, may be constructed to embrace a distance not exceeding 125 or 130 miles, perhaps less. A company exists, is organized, and stock enough taken to secure the charter, through New Jersey and is in good hands. In the official proceedings I see the names of G. D. Wall, Mr. Southard, and other distinguished personages. They, of course, mean no child's play, nor enter into it merely as matter of speculation. Now further, the line from the termination of the New-Jersey Road, through Pennsylvania to Pittston, is also authorised by law—a company formed, and the charter obtained. But the money is wanting. I will not deny, nor attempt to hide from you, that I am interested in this matter; otherwise I should hardly trouble myself to indite letter after letter, number after number, to you, in relation to it. But the interest that I have cannot affect the statements I make; "they will bear the test of scrutiny and of time." Examine them closely yourselves. Now, if the thing does most deeply concern the highest and best interests of your noble City, is it of any consequence who it is that calls your attention to the subject? The three great rival cities of Baltimore, Philadelphia, and New York, are in honorable competition for the North-Western trade. The facilities which New-York possess

for foreign commerce, should stimulate her to open every proper avenue into the country; for the foreign trade must depend on the interior business. Rhode-Island, as a mere port for shipping is not inferior to any in the Union. A great portion of the trade of Lake Erie and the upper inland seas—the new state of Michigan, as well as northern Ohio, the great territory of Wisconsin, and much from the Canada side may be secured to New York by the Railroad from Buffalo to the city.

Would it not then be wise, besides indvidual subscriptions, for the city corporation to take 500,000 dollars in the stock of the company; and should not an appeal be made to the State Legislature to take half a million or more? Would not, and should not New-Jersey, as a State, subscribe 3 or 400,000 dollars?

CLINTON.

We have for some time had on our desk, the very able report of Col. Long, on a Reconnoissance for a Railroad from the coast of Maine to Quebec.

The report is a voluminons one, as a general examination of the whole coast was necessary. Several routes are given in detail, but as the one from Belfast has been adopted, we have given that only.

Much of general interest as to the matter of construction and location is to be found in this report, and when space is found, we shall be pleased to make future use of the document.

We have received the Charter of the Belfast and Quebec Railroad, as formed recently by the Legislature of the State of Maine.

It may be well to remark in this place, that, this route is, in the opinion of those enabled by observation to judge, inferior to none of those communicating between the Atlantic and St. Lawrence, with the exception of the route of the Erie Canal.

ROUTE NO. 3. FROM BELFAST TO QUEBEC.

Length of the Maine Division, one hundred and thirty-three miles. Length of the Canal Division, ninety-four miles. Aggregate distance from Belfast to Quebec, two hundred and twenty-seven miles.

Sub-divison No. 1. Extending from Belfast to Sebasticook river, and embracing a distance of thirty-one miles.

The facilities afforded at Belfast, for a connexion between the Railroad, and the commercial and other business, likely to be done at the depot, where it terminates, are equally commodious with those presented at Wiscasset, while they are to be had on a much more extensive scale.

The estuary of Belfast or Pasagasawakeag river, extends inland about two miles from the head of Penobscot Bay, of which it is an arm, and is navigable for heavy shipping, about two thirds of a mile, for sloops as much farther, and for smaller craft nearly to the head of tide. This arm of the Bay varies in its width from one hundred and fifty yards to a mile or more. At the upper bridge which is about a mile above the site of the present town of Belfast, it is contracted to the width of about one hundred yards, below which, it gradually widens, till we arrive at the principal landing of the town, where it is more than a mile wide.

The mode of connexion had in view contemplates a branch of the Railroad, extending downward from the upper bridge, on each side of the arm or estuary above described; both of which branches may be extended to the distance of two or three miles each, and as much farther as may be desirable both sides of the estuary, and the shores of the Penobscot Bay, being favorable for such an extension.

The elevation at which the town of Belfast can be most conviently approached, by the Railroad, can only be determined by actual survey; which will probably show that an elevation between thirty and fifty feet above tide, will be most appropriate. At the narrows above mentioned, or at the site of the upper bridge, both having the same locality, the ground and shores are favorable for assuming the desired elevation, and the estuary may here be crossed by a bridge of the requisite height, and about one hundred and fifty yards long.

At the site just mentioned we shall commence the description of the route which proceeds thence northwardly as follows, viz: From the upper bridge it passes along the eastern shore of the estuary, about half a mile, on rough and broken ground, crossing several ravines, and perhaps the point of a cove, to the mouth of Wescott stream, whence it ascends in the valley of this stream nearly a mile on rough ground. It thence pursues the same valley, nearly to the source of Wescott stream, where it encounters a summit, elevated about thirty feet above the flats of the stream, and dividing between the waters of Belfast river, and Marsh stream, which enters the Penobscot river at Frankfort. This summit is situated in an extensive tract of swampy ground, through which the route passes, and afterwards enters the valley of marsh creek at the distance of twelve or thirteen miles from its mouth.

The distance from the upper bridge at Belfast to the valley of Marsh creek, is computed at ten miles, through which the route is somewhat serpentine, and near its entrance into the valley just mentioned, quite circuitous. Its curvatures however, may be limited to a radius of one thousand feet; and its gradations to thirty-five feet per mile. On ascending from the flats of Wescott stream to the summit a rise of thirty feet is incurred, in less than a quarter of a mile, the passage of which will require much embankment, and considerable cutting in rock. The flats at the summit present at extensive quag, upon which the road bed must be supported on piles or broad grillage, for the distance of half a mile or more. Materials of the best quality for construction are abundant and convenient.

From the point of entrance into the valley of Marsh Creek, the route proceeds upwards in this valley, and on broken ground, about a mile to Brooks village, and ascends thence two miles, in the same valley, and on favorable ground to Sawyer's mills, whence it ascends for about a mile at a gradation of sixty feet per mile, to flats situated near the head of the stream, where it passes a very low summit. The flats just mentioned embrace the sources of Haskell's and Half Moon stream, and present a favorable passage for the route leading through an extensive cedar swamp, to the valley of the latter, down which it proceeds to the junction of this stream with Sandy river. From this point the route pursues the valley of Sandy river, downward to the plains connected with the basin of Twenty-five Mile Pond, whence it traverses an extensive flat, in places low and marshy, but generally of a uniform and even aspect, quite to the Sebasticook, which it reaches at or near the place called the Pug Hole, about two miles below the mouth of Twenty-five Mile Creek, which flows from the Twenty-five Mile Pond.

The distance from the point of entrance into the valley of Marsh creek to the Sebasticook, is computed at twenty-one miles, viz: from that point to the summit, five and one half miles, thence to Unity village, three and one half miles, and thence to the Sebasticook seven miles.

With the exceptions already made, the gradations on this part of the route, will be easy, no where exceeding thirty-five feet per mile. The curvatures will be gentle, being limited to a radius of one thousand feet, in one instance only, viz: at Sawyer's mills. The road formation will be generally easy, except where bridges and embankment are wanted, several of which will probably be required on the streams along which the route passes, and a bridge of large size, at the crossing of the Sebasticook, probably one hundred and fifty yards long, and forty feet high.

The abrupt gradation of sixty feet per mile, included in this sub-division, may be avoided, and forty-feet per mile substituted, at the expense of considerable excavation, and embakment, at the place where it occurs. With this exception, the gradations in very few instances, will amount to thirty-five feet per mile, while the rout on much of the way will vary from a level but a very few feet in the mile.

Sub-division No. 2. Extending from the Sebasticook to Bingham, and embracing a distance of thirty-four miles.

From the crossing of Sebasticook river, the route traverses a level or slightly rolling surface, to the valley of Twelve Mile stream, and then ascends in this valley on favorable ground, quite to its source, when it crosses a lower summit, at the distance of five miles from the Sebasticook. At this summit the route enters an extensive flat stretching northwardly ten or twelve miles, and embracing Sibly's, Height's and Moose Ponds, the elevation of the flat above Kennebec river, being about one hundred feet. The route traverses this extensive swamp, passing in the vicinity of Sibly's and Height's Ponds, from the last of which the route passes over a very low summit, and enters the valley of Wesrunset near Athens village. The distance from the Sebasticook to Sibly Pond by the route above indicated, is computed at ten miles—a route quite as favorable and somewhat shorter, between the points just mentioned, is said to exist a little to the eastward of the route described. From Sibly Pond to the summit near Height's Pond, the distance is computed at 9 miles.

After passing this summit and entering the valley of Wesrunset, the route passes on uneven ground about one and a half miles, in the vicinity of Athens village, and ascends in the valley to Wentworth Pond, and after crossing a low summit, may descend by either of three routes to the immediate valley of the Kennebec, the distances being about equal on each. The routes from the summit downward are as follows, viz. one by the valley of Michael's stream; one by that of Fall Brook, both of which terminate at Currituck Falls; and the third by the valley of a stream entering the Kennebec river, a little below the village of Bingham, near which this route approaches, and must cross the river, on a bridge about two hundred yards long. Although these several routes are about equal in respect to the facilities they afford for arriving at the

river, yet inasmuch as that last mentioned strikes the river about eight miles above the point at which the others reach it, the route leading through Bingham, and crossing the river at some point near the village, is regarded as fairly entitled to a preference. We shall accordingly consider the crossing of the river, at this place, as the end of this sub-division.

The distance from the summit near Height's Pond, to Bingham, is computed at fifteen miles. The road formations on this part of the route will require much cutting and filling, in order to pass numerous ravines, and other inequalities, which it must encounter.

The curvatures on this entire sub-division, may readily be limited to a radius of one thousand feet, and the gradations to thirty-five feet per mile. Extensive portions of the route may be kept free from curvatures, and nearly level. The country abounds in timber, and other materials well adapted to the purposes of construction.

In reference to this, and the preceding sub-division, it should be remembered, that instead of the route, leading from the confluence of Half Moon and Sandy streams, to the summit near Height's Pond, a different route may be substituted which may prove quite as favorable in all respects as that before described, and which ought to be carefully surveyed, before a decisive preference is given to either. The route alluded to, leaves the valley of Sandy river, near the point above indicated, passes near Twenty-five Mile Pond, probably on the east side of it, and proceeds thence to Peoltoma Point, in the township of Chandlerville. From this point it ascends in the valley of the Sebasticook, passes Moose and Height's Ponds, and unites with the other route at the summit, in its vicinity.

Sub-division No. 3, extending from Bingham to the mouth of Wilson's stream and embracing a distance of twenty-four miles.

This sub-division from a point opposite to Bingham, in the valley of the Kennebec, 8 miles above Currituuk Falls, is coincident with the 2d subdivision of Route No. 2, of th Wiscasset and Quebec Route, from th same point to the mouth of Wilson's stream in the valley of Dead River, one mile above its mouth. *Sub-divisions No. 4. No. 5 and No. 6, of this Route,* viz:—the Belfast and Quebec Route—are also coincident and identical with the same sub-divisions of Route No. 2, to which reference is respectfully made.

We shall conclude our description of this grand Route with a brief synopsis as before, exhibiting items of information similar to those contained in the synopsis of Route No. 1, or in that o Route No. 2.

SYNOPSIS OF ROUTE NO. 3, OR THE BELFAST AND QUEBEC ROUTE.

GRAND DIVISION.	Sub-divisions. No.	LOCALITIES. Beginning at Belfast, and including the places designated.	Supposed distances under different gradations. 0 to 35 feet per mile.	35 to 60 feet per mile.	60 to 90 feet per mile.	Distances on each Sub-division.	Length of each Sub-division.	Distances and Lengths of Grand Divisions.	Probable cost of road formation. Average cost per mile.	Probable aggregate cost.
			Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Dolls.	Dolls.
MAIN DIVISION.	1	Bridge, &c. at Belfast,								10,000
		Marsh Creek,	10			10			8,000	80,000
		Unity Village,	13	1		14			7,000	98,000
		Sebasticook River,	7			7	31	31	6,000	42,000
		Extra for a Bridge, &c.								8,500
	2	Height's Pond summit,	19			19			6,000	114 000
		Bingham,	15			15	34	6	7,500	112,500
		Extra for a Bridge, &c.								10,000
		Mouth of Wilson stream,	24			24	24	89	7,500	180,000
		Extra for a Bridge, &c.								12,000
	4	Head of Parlin Pond,	4	3	7	14			9,000	126,000
		Holden's on Moose River,	16			16			6,000	96,000
		Extra for a Bridge, &c.								5,000
		Boundary summit,	11	1	2	14	44	133	8,000	118,000
		AGGREGATES.	119	5	9	133	133	133	7,564	1,006,000
CANADA DIVISION.	5	Mouth of the de Loup,	25	5		30	30	30	9,000	270,000
		Extra for Bridge, &c.								20,000
	6	St. Mary's,	40			40			7,000	280,000
		Extra for a Bridge, &c.								9,000
		St. Henry's,	11			11			4,500	49,500
		Extra for a Bridge, &c.								7,000
		Head of inclined plane,	10			10			4,000	40,000
		Point Levy,	1	1	1	3	64	94	10,000	30,000
		Extra for inclined plane,								10,000
		AGGREGATES.	87	6	1	94	94	94	7,612	715,500
		Aggregates for the entire Route.	206	11	10	227	227	227	7,584	1,721,500

The foregoing exhibit shows, that the entire length of Route No. 3, from Belfast to Quebec, is two hundred and twenty-seven miles; which is shorter by nineteen miles, than Route No. 2, from Wiscasset to Quebec, and fifty miles shorter than Route No. 1, from Portland to Quebec. Of the distance above stated (227 miles) two hundred and six miles are attended by gradations not exceeding thirty-five feet per mile; eleven miles by gradations varying from thirty-five to sixty feet per mile; and ten miles by gradations not exceeding ninety feet per mile. It also appears from the Synopsis, that the average cost per mile, for road formation, bridges, &c. included, is seven thousand five hundred and eighty-four dollars, and that the aggregate cost of this item, on the entire route from Belfast to Quebec, with a road surface twenty-five feet wide, is one million seven hundred and twenty-one thousand five hundred dollars.

To this amount, if we add as before, seven thousand dollars per mile for a single track, or thirteen thousand dollars per mile for a double track, we shall have for the aggregate cost of a double track Railroad from Belfast to Quebec, four millions six hundred and seventy-two thousand five hundred dollars.

It will be perceived that in the several tabular views, comprehended in this Report, no allowances have been made for surveys, superintendance or contingencies of any kind; we shall accordingly subjoin a brief general Synopsis of the Grand Routes, in which the allowances of this character, deemed requisite and proper, will be included, and with which we shall conclude our description of the several routes.

SYNOPSIS OF GRAND ROUTES FROM THE COAST OF MAINE TO QUEBEC.

GRAND ROUTES.	Localities at the commencement and termination of each Route.	Length of each Grand Route.	Distances under different gradations. 0 to 35 feet per mile.	35 to 60 feet per mile.	60 to 90 feet per mile.	Probable cost of a Railroad on each Grand Route, all things included except the right of way. Cost of grading per mile.	Cost of grading and railing per mile.	Cost per mile including 5 per cent. for contingencies.	Aggregate cost of each Grand Route.
No. 1 Portland to Quebec		Miles. 277	Miles. 249	Miles. 18	Miles. 10	Dolls. 5,831	Dolls. 21,831	Dolls. 22,923	6,349,671
No. 2. Wiscasset to Quebec		246	224	12	10	7,982	20,982	22,031	5,119,626
No. 3. Belfast to Quebec		227	206	11	10	7,584	20,584	21,613	4,906,151

This Synopsis is intended to exhibit the extent of each grand route; the distances under different gradations, for each route; the average cost per mile for road formation, as derived from the foregoing tables; and for this item including the cost of railing for a double track; the average cost per mile of this last item, (grading and railing combined,) including an allowance of five psr cent. for contingencies, &c. right of way excepted; and the aggregate cost of each

entire route, with the exception just mentioned, all other expenses being included.

From this Synopsis it appears that the cost of a Railroad from Portland to Quebec, all things included except the right of way, amounts to about six millions three hundred and fifty thousand dollars, which gives for the average cost per mile, twenty-two thousand nine hundred and twenty-three dollars. That the cost of a railroad from Wiscasset to Quebec, amounts to about five millions four hundred and twenty thousand dollars, or to an average cost per mile of twenty-two thousand and thirty-one dollars. And

That the cost of a railroad from Belfast to Quebec amounts to a little more than four millions nine hundred and six thousand dollars, which is equivalent to an average cost of twenty-one thousand six hundred and thirteen dollars per mile.

Hence it appears, also, that the aggregate cost of Route No. 3, is less than that of Route No. 2, by five hundred and thirteen thousand four hundred and seventy-five dollars; and that the average cost per mile of the former, is four hundred and eighteen dollars less than that of the latter. Moreover,

By a similar comparison with Route No. 1, the difference in favor of Route No. 3, amounts to one million four hundred and forty-three thousand five hundred and twenty dollars, in their aggregate cost, and to one thousand three hundred and ten dollars in their average cost per mile.

In view of what has been advanced in this paper, no doubt can remain as to the route entitled to the preference, not only on account of their relative distances, and the probable cost of a railroad on each, but on account of the comparative facilities for travel and transportation presented by them respectively. These, and a variety of other considerations, relating to the accommodation, welfare, and future prosperity of the State of Maine, as well as to those of Lower Canada, combine to render the route from Belfast to Quebec, more eligible and advisable than either of the other routes herein described.

With respect to the cost of the contemplated railroad, as herein computed, I am aware that is far less per mile, than has been incurred on the railroad from Baltimore to Washington from Philadelphia to Columbia, from Hollydaysburg to Johnstown across the Alleghany mountains, from Camden to Amboy, from Boston to Providence, Lowell and Worcester, and on various other railroads of the United States, now in successful operation; yet from a careful comparison of the facilities presented on the routes herein described, with those of the routes pursued by the railroads just alluded to, it is confidently believed that the prices annexed and the allowance made in the preceding tables, will prove adequate to the construction of the road in question, agreeably to the manner proposed.

REPORT ON THE SURVEYS AND DEFINITE LOCATION OF THE EASTERN RAILROAD.

BY JOHN M. FESSENDEN, CIVIL ENGINEER.

To GEORGE PEABODY, Esq., *Chairman, and the Members of the Committee for obtaining Surveys, Location, &c. for the route of the Eastern Railroad,*

GENTLEMEN,

I submit herewith a Report of the examinations, surveys, and location for the route of the Eastern Railroad, commencing at Boston, and terminating at the New-Hampshire State line, made agreeably to your request, together with the plans and profiles of said location.

By your directions my attention was first given to the Turnpike between Boston and Salem, for the purpose of ascertaining the facilities which the whole or any part of it would afford for the construction of that portion of the route; the results of the examinations and surveys for this purpose were reported to you immediately after their completion, and were to the effect that the great elevations to be overcome on the road near Salem, would make it necessary to resort to a rate of inclination inadmissible for locomotive engines, unless such an expenditure for grading should be made as even the free gift of the whole turnpike would by no means justify, and further, that no part of the turnpike could be used for the construction of the railroad, without much increasing the length of the route, and seriously injuring the turnpike for ordinary travel; and these evils would be encountered without any saving of expense in the construction as compared with the route finally selected.

[Mr. F. here states at length his reasons for adopting the entrance through East Boston. We omit them, as they are matters of local rather than general interest.]

In making the definite location for the whole track, while the convenience of the public travel and business generally, more than that of the towns or places, by or through which it was to pass, was aimed at, and this because a continuation of the railroad is anticipated which will make it one of the most important routes in the country; yet the location is such as will well accommodate most, if not all, of the towns; and if in one or two cases it does not come so near the business part as could be wished, I believe a proper feeling exists throughout the line, to sacrifice a little convenience for the general good of the whole road, and of those who use it.

The line, as located, commences in Boston, a short distance below Commercial Wharf, and with a ferry about 600 yards in length reaches East Boston; it then passes through the proposed depot to Decatur street, from this street it runs direct and nearly parallel to Chelsea street about one mile, and then curves lightly to the left to a point near the first bend in that street, then direct about two miles, crossing the westerly end of Belle Isle to station No. 29, on the hill east of Chelsea meeting-house, thence after curving to the left a short distance, the course is direct, crossing the marshes, Chelsea Creek and Saugus River, to its left bank, at a point about 300 yards from its mouth, thence after curving to the right a half mile to station 73 on the marsh near Breed's lumber yard, the course is direct through the village of Lynn to a meadow south of Rufus Parrott's house, from thence by light curves and direct lines for about three and a half miles, the route passes near the house of Pickering Dodge, crosses a low depression in the ridge which divides the waters running into Salem and Lynn harbors, then runs by the head of the swamp to near Castle Hill, crosses the mill-pond and passes near the lead factory to the hill north of Harbor street; from this point the line is direct, crossing the town of Salem to North River, where it curves to the right to near Northey street, thence direct crossing Bridge street, and thence by a curve and direct line to the left bank of North River in the town of Beverly, and at a point about 550 feet below Beverly bridge; thence, with the exception of two short curved lines, the course is direct for about five miles, crossing the road to Newburyport, near Dr. Kittredge's house, then running near the houses of William and Levi Dodge and the house of Daniel Rust, sr., thence the line is direct to G. and B. Appleton's house, and nearly so to G. Chapman's house in Ipswich, crossing in its course the Topsfield road, and then following down the left bank of Ipswich River; from Ipswich the line is nearly direct to a cross road a few rods beyond the Newburyport road, and from thence direct for about seven miles, crossing the meadows of Ipswich, Rowley, and Newbury, and Rowley, Parker and Little Rivers; thence, after a short curve, the line is direct, crossing the Newburyport turnpike and High street to the intersection of Court and Union streets, and from this intersection by a reversed curve to the bridge over the Merrimac River at the foot of Water street, thence after crossing over the bridge, the course is, with the exception of three very light curves, direct to the New-Hampshire State line.

The location as thus described, is unusually favorable both as to grade and alignment, I believe the most so of any in the country. The whole distance from Decatur street, East Boston, to the proposed depot, beyond High street in Newburyport, is 33 miles, 4,123 feet, of which distance 27 miles, 2,987 feet is straight, and the remaining 6 miles, 1,136 feet, with the exception of 3,225 feet, is curved on radii of from about one to three miles in length; the distance of 3,225 feet is on radii of about one fourth of a mile, and is mostly on the sites of proposed depots, where the usual speed will not be required.

The grade or inclination of the line from East Boston to the proposed depot in Newburyport, is as follows:

7 miles,	0411	feet	descending	from $7\frac{1}{2}$ to 20 feet per mile,
18 "	3303	"	level,	
2 "	3842	"	ascending	from $4\frac{1}{2}$ to 10 feet per mile.
4 "	2027	"	"	from 10 to 20 feet per mile,
0 "	5100	"	"	30 ft. per mile

33 miles, 4123 feet.

The total ascent to Newburyport is 130 feet, or less than 4 feet per mile for the whole distance.

The grade of the line from Newburyport to Boston is as follows:

				feet per mile.
8 miles,	0409 feet	descending from		4½ to 30
18 "	3303 "	level,		
3 "	4486 "	ascending from		7½ to 10
3 "	1205 "	"	"	10 to 20

33 miles, 4123 feet.

The whole ascent to Boston is 96 feet, or less than 3 feet per mile for the whole distance.

There is no greater inclination than 20 feet to the mile between Boston and Newburyport, except near the proposed depot at the latter place, where there is a short plane (5,100 feet) at 30 feet per mile.

The distance from Newburyport to the State line is 3 miles, 2,943 feet; of this,

				feet per mile.
0 miles,	5243 feet	is descending,		30 to 35
0 "	2820 "	level,		
0 "	2390 "	ascending,		32
1 "	3050 "	"		6

3 miles, 2943 feet.

In crossing the Merrimac River, it is proposed to make use of the abutments and piers of the chain bridge, and to construct a double road in such a manner, as will allow the ordinary travel to pass over in the same way that it does now, and the railroad travel directly above; such a construction would be better and more firm than the present one, or than a construction which permitted the two roads to pass, the one by the side of the other.

On reference to the profiles on the accompanying plans, it will be seen that the grade of the railroad in nearly every case, will be such at the different points where it is crossed by the most important town or county roads, as to permit their being passed either above or below the railroad, at a small expense beyond the cost of the abutments and bridges. The grade of the road is in no place lower than five feet above high tides.

The estimates for the grading, masonry and bridging of the road, are calculated for a width of twenty-six feet for the embankments, and twenty-eight feet for the excavations.

[We omit the details of the estimate. The sum total is $616,998 11.]

In the estimates for the railway construction, I have provided for a chair which will support the rail at a much greater elevation from the bed than any that have heretofore been used; experience has shown the great advantages which may be derived from this elevation, especially with regard to snow, as it will but very rarely fall in sufficient quantities to seriously obstruct a track thus raised. In the form and dimensions of this chair, I have obtained the requisites of sufficient strength and height, without very much increasing its weight over those in general use; I have provided also for a rail heavy enough to permit the chairs to be placed 3 feet 9 inches apart, or 4 to each rail, instead of five as generally placed; by this arrangement there will be a saving of chairs, sleepers, and expense of construction more than equal to the cost of the extra weight of the rail, and the advantages will be obtained of a less deflection in case of the derangement of a sleeper, less amount of perishable material, as the number of wooden sleepers will be less, and the road will be more easily kept free from obstructions.

The plan of construction which I propose, is to use the above rail and chair, with large sized cedar sleepers to be covered with gravel deep enough to ensure great durability; these sleepers to rest on rough five inch plank, and where the frost penetrates to a greater depth than this, stone will be placed under the plank, this will be necessary, however, only for a small part of the route. The disposition of the plank as above will unite several sleepers and completely prevent abrupt deviations in the road. I consider a wooden sleeper thus laid and protected, as far superior to one of stone, on account of the elasticity it gives to the track, saving much wear and tear of machinery and making an easier road for the traveller, to say nothing of the very great saving of expense under every view. The rails are to be fastened in the chairs with well seasoned wooden keys, which, from the subsequent expansion of the parts without the chair will be much less liable to drop out or become loose than iron keys; wooden keys have been tested on roads both in this country and in Europe.

ESTIMATE FOR MATERIALS AND LAYING OF ONE MILE OF RAILWAY.

110 tons of rails, chairs, and spikes, average cost delivered, $50 per ton	5,500	00
1410 cedar sleepers at 40 cts.	564	00
2820 wooden keys	50	00
Materials for foundation, whether of wood, or of wood and stone, average	850	00
Laying foundation, dressing and laying sleepers, laying rails, filling in track, &c. &c.	1,536	00
Total,	$8,500	00
For 37 miles 1786 ft. at $8,500 per mile	317,375	19
2 miles for turnouts and depot tracks	17,000	00
Total for Railway	$334,375	19

Aggregate cost of the whole route for one track with turnouts and the necessary depots, buildings, machinery, and fixtures:

Grading, masonry, and bridging	616,998	11
Railway, turnouts, and depot tracks	334,375	19
Depot buildings and fixtures	68,000	00
8 Locomotive engines and tenders, 25 passenger and 100 merchandize cars	100,000	00
Land damages and fencing	60,000	00
Depot wharf, East Boston	50,000	00
Ferry arrangements	60,000	00
Depot landing, &c. Boston	50,000	00
Engineer Department and other expenses, say	35,626	70
	1,375,000	00
Deduct cost of constructing the Railroad from the centre of Merrimac River to the State line	75,000	00
Total,	$1,300,000	00

In making the foregoing estimates, having in view the vast importance of the road, indicated by a very large and increasing amount of travel and transportation, which it is well known will be brought upon it, I have not in the least degree hesitated at meeting and providing for the cost of the best materials, mode of construction and accommodaitons throughout; I do not know of any improvement within the bounds of reason, especially with regard to the Railway, that a greater expenditure of money would secure. The amount of rail iron per mile, is greater than is used upon any road in this country, and equal to that on any in Europe, and it is required to secure the benefits which I have before named, and in fact to furnish a road with all the facilities and advantages requisite to insure as nearly as possible, its free use at all seasons, in this section of the country. The work and materials estimated for and their cost, I have endeavored to put down in this report equal to what they will actually amount; still I must add that I have expectation that the work will be executed for something less than the sums I have named; should this be the case, the difference, together with the means that might be in the possession of the company, it is probable would enable them, when it should be thought best to lay a second track on the road from Boston to Salem, to do so, without a further call upon the stockholders. The length of this second track will be 13½ miles, and the cost of laying it down 8,500 dollars per mile, or about 112,000 dollars for the whole distance.

The annual expenses of the road when in full operation, allowing as I have done in the estimates for machinery, accommodations, &c., for a much larger amount of travel and transportation than that which at present passes over the route, will not differ much from 1,750 dollars per mile, or 60,000 dollars, which sum will meet the salaries of a Superintendant and 44 others, to wit: assistants, machinist, clerks, engine and firemen, depot and brake-men. Fuel for from 6 to 12 trains yer day. Repairs and depreciation of engines and cars at 18 per cent. per annum, and full repairs of the road.

The grade of the road is so favorable that the accommodations and annual expenses estimated for, would enable the company to transport per year, more than 35,000 tons of merchandize and 175,000 passengers, supposing no more than two thirds of the engines to be always ready for use, and only three-fourths of the passenger, and one half of the merchandize cars to be in requisition on any one day.

As to the amount of business which it would be safe to calculate upon for the revenue of the road at the commencement of its opetations, I have no means of judging, except from the reports heretofore made to the Legislature, and from the business done on other roads in the vicinity; the

latter showing only the disposition of the public to avail themselves of the advantages which Railroads offer; from these data it would be quite safe to expect it to equal per year.

110,000 passengers carried over the whole route at 1,33 cts.	146,300 00
18,000 tons of merchandize at 2,50 per ton	45,000 00
	191,300 00
Deduct annual expenses	60,000 00
and there remains a nett income of	$131,300 00

or more than 10 per cent. on the cost of the road. If this estimate should appear to some to be too large, the knowledge of the fact that the business, I believe, on every Railraad route known, has increased from 100 to 700 per cent. in consequence of the facilities which they offered, and will lead them to acknowledge that the amount stated above, if not at once, would in a very short time be more than realized. The rate of 1,33 cts. for each passenger, together with that of 2,50 per ton of 2,000 lbs. of merchandize, is much lower in proportion to the length of the road than the average of the rates charged on the Railroads in this vicinity. The rate which I have assumed for the whole route, gives for that of the part from Boston to Salem 50 cts. for each passenger.

In making the surveys and location of this route, a great portion of the field duty fell upon my chief assistant, William Parker, Esq., who, with the assistants attached to him, Messrs. H. Stebbins and J. Adams, are entitled to much praise for obtaining so favorable results. The topography and drawing are the very creditable labors of Messrs. W. D. Wallack and S. Ashburner.

I am, Gentlemen, very respectfully
your obedient servant,
JNO. M. FESSENDEN, *Engineer*.

RAILROAD AND CANAL INTELLIGENCE.

From the Ashtabula Sentinel.

ASHTABULA, WARREN AND LIVERPOOL RAILROAD.

It will be seen by the notice in our columns to-day, that a meeting of the Stockholders is to be held at Warren on the 28th day of June next, for the purpose of organizing under the charter. The amount subscribed along the route, we understand, is rising of one hundred thousand dollars. A much larger amount than this, can and should be subscribed on the line of the road, and we believe will be. We ought not to depend upon foreign capitalists to take up the stock. The people along the line have the means within themselves to construct the road, and it is for their interest to do so. The rise of property within a few miles of the line of the road, occasioned by its construction, will be more than sufficient to build it; and possessing advantages not equalled by any other route between the Lake and the Ohio river, the stock will undoubtedly yield a handsome profit to the holders. Under these circumstances, we appeal to the land holders—to our citizens who are directly and deeply interested in the speedy completion of this important work, to come forward immediately and take up the stock, and keep the controlling power within themselves, and not suffer it to fall into the hands of foreign capitalists. We have not yet received the Report of the Engineer who has recently surveyed the route, but understand that he found it more favorable than had been expected.

MONROEVILLE AND SANDUSKY RAILROAD

When the charter of this company was obtained, we had little expectation that the road would be made, but we judged of men and things as in olden times. We begin to find that calculations which would have been rational enough ten or twelve years ago, are entirely unsuitable to the spirit of the present times. Instead of lingering as such a work (or even one of much less magnitude) would then have done, a sufficient portion of the stock was promptly taken, by citizens interested in the route, to encourage the company to make an immediate commencement. The whole route was therefore put under contract, and the work is now progressing.

The zeal manifested by this company has had a happy influence on the people of the south, who have obtained charters for different companies, so as to make a continuous line from the termination of this road, at Monroeville, to Newark, where it will meet the Ohio Canal. If the citizens who have obtained those charters, act with as much promptitude, as the Monroeville and Sandusky Railroad Company have done, we may safely look for the completion of the whole line in two or three years. It runs through a part of the State where such an improvement is much needed, and which has not been at all benefited, except at its southern termination, by the improvements which the State has made at so heavy an expense, and at so great a sacrafice of the rights and interests of the people.—[Sandusky Clarion.]

AKRON AND PERRYSBURG RAILROAD.—The commissioners for organizing the Akron and Perrysburg Railroad company met at Norwalk, on the 25th ult., and resolved that books for subscription to the stock of said company, opened at Perrysburg, Lower Sandusky, Norwalk, Wellington, Medina and Akron, on the 25th inst.: and that Uriah H. Peak and James Justice be appointed to employ an engineer, and to obtain releases of persons owning lands along the route.

SANDWICH AND FORT ERIE RAILROAD.—There remains no doubt but that the bill authorizing the construction of this important work through Upper Canada, has become a law. Our citizens cannot be unmindful of the important bearing which it will have upon the interest of this place. We think that in accordance to the custom which every where prevails on such occasions, our citizens should make some suitable public demonstrations of the lively interest which they take in this important work. We shall publish the bill as soon as we can get a copy.—[Detroit Journal.]

We are authorized to state that the entire stock of the Detroit and Maumee Railroad has been taken up by the citizens of this place, Capitol, $500,000.—[Ib.]

From the Journal of the Franklin Institute.

COMMITTEE ON SCIENCE AND THE ARTS.

Report on Mr. A. C. Jones' Spark Arrester.

The Committee on Science and the Arts, constituted by the Franklin Institute of the State of Pennsylvania for the promotion of the Mechanic Arts, to whom was referred for examination, an apparatus for stopping the sparks from the flues of locomotive engines, invented by Mr. Alfred C. Jones, of Portsmouth, Virginia, Report:—

That it has for some time been considered a desideratum to devise a plan by which the sparks escaping from the chimney, or smoke pipe, of a locomotive engine, may be arrested, so as to ensure both the comfort of passengers, and the safety of goods, transported on Railroads. The rapid extension of this mode of conveyance, is every day rendering this object of increased importance. Judging from the certificates of engineers and others, exhibited by Mr. Jones, it may be inferred that he has been more successful in relation to it, than preceding inventors.

The principal peculiarities of Mr. Jones' invention, are the following.

1. A projection, and funnel shaped opening, in the front part of the wire gauze, which surmounts the smoke pipe. This opening is for the purpose of admitting the external air to mix with the escaping smoke and steam, and is supposed to have the double effect of cooling and condensing the smoke and steam, so that it will not burn and destroy the wire gauze, and of producing a horizontal, or backward, current of air, which throws the sparks into the receptacle hereafter described.

2. A peculiar shape in the wire gauze cap, extending a considerable distance backward, over or beyond the back of the top of the smoke pipe, which affords a space for the sparks to be thrown down into the receptacle hereafter described, the shape of the back part of the cap, or wire gauze, being such that the sparks do not strike it perpendicularly, but obliquely to its surface, and thus are thrown down, instead of passing through the apertures.

3. A receptacle for sparks, back of the top of the smoke pipe, and under the back part of the gauze cap, at the lower part of which receptacle is a pipe, extending downward into the smoke chamber at the end of the boiler, and below the part immediately connected with the boiler. Through this pipe, the sparks pass, and fall into the bottom of the smoke chamber. It is supposed by Mr. Jones, that the impetus of the steam, escaping from the engine, through the smoke pipe, produces a partial vacuum in the bottom of the smoke chamber, and causes a portion of air to rush down the said pipe, which makes the sparks more readily descend, to a place where they are beyond the influence of the escaping current of smoke and steam, there to be consumed.

4. The gauze cap is made with hinge joints, so as to be thrown over backward, when the engine is not under way. This contrivance serves the double purpose of preventing the gauze from being clogged with lampblack, by the thick smoke escaping before the starting of the engine, and of facilitating the cleansing of the gauze, by a brush applied to its inner surface, where the smoke and lampblack condenses.

It is the opinion of the committee, that each of the foregoing features is productive of advantage. Hence, they are of opinion, that Mr. Jones' apparatus is among the best that has been devised; an opinion which is

confirmed by the respectable testimony which has been adduced.

There is a suitable apparatus for arresting the sparks when the engine is going backward, which it is deemed unnecessary here to describe.

By order of the Committee.

WILLIAM HAMILTON, *Actuary.*

January 14, 1836.

From the Journal of the Franklin Institute.

SPECIFICATION OF A PATENT FOR AN IMPROVEMENT IN THE MODE OF TURNING SHORT CURVES UPON RAILROADS, WITH RAILROAD CARRIAGES, PARTICULARLY THOSE ROUND THE CORNERS OF STREETS, WHARVEE, ETC. GRANTED TO JAMES STIMPSON, CIVIL ENGINEER, BALTIMORE, MARYLAND, AUGUST, 23D, 1831. PATENT SURRENDERED AND REISSUED ON AN AMENDED SPECIFICATION, SEPTEMBER 26, 1835.

I use or apply the common peripheries of the flanches of the wheels, for the aforesaid purpose, in the following manner.

I lay a flat rail, which, however may be grooved, if preferred, at the commencement of the curvature, and in a position to be centrally under the flanches of the wheels upon the outer track of the circle, so that no other part of the wheels which run upon the outer circle of the track rails, shall touch, or bear upon, the rails, but the peripheries of the flanches, they bearing the whole weight of the load and carriage; while the opposite wheels which run upon the inner track of the circle, are to run and bear upon their treads, in the usual way, and their flanches run freely in a groove, or channel; which treads are, ordinarily, about three inches in diameter, less than the peripheries of the flanches. Were the bearing surfaces of the wheels, which are in contact with the rails, while thus turning the curve, to be connected by straight lines from every point, there would thus be formed the frustrums of two cones, if there be four wheels and two axles to the carriage; or, if but one axle and two wheels, then but one cone; which frustrums for the wheels representing their extremities, will, if the wheels are thirty inches in diameter, and are coupled about three feet six inches apart, turn a curve of about sixty feet radius of the inner track rail. The difference in diameter between the flanches and treads, before stated, the tracks of the usual width, and the wheels coupled, as stated, would turn a curve of a somewhat smaller radius if the axles were not confined to the carriage in a parallel position with each other; but this being generally deemed necessary, the wheels run upon lines of tangents, and those upon the inner track being as wide apart in the coupling as the outer ones, keep constantly inclining the carriage outwards, and thus cause the carriage to tend to run upon a larger circle than the difference in diameters of the treads and flanches would otherwise give; but the depth of the flanches, and the couplings, may be so varied as to turn any other radius of a circle desired.

What I claim as my invention, or improvement, is the application of the flanches of the wheels on one side of Railroad carriages, and of the treads of the wheels on the other sides to turn curves upon Railways, particularly such as turning the corners of streets, whaves, &c., in cities and elsewhere, operating upon the principles herein set forth.

JAMES STIMPSON.

From the Journal of the Franklin Institute.

PRESERVATION OF WOOD FROM DRY ROT.

It is stated as the result of observations made in the German mines, that pine wood which has been exposed to the action of water under pressure, is not subject to the dry rot. A stick of pine wood, placed in water in an iron pipe, absorbed in thirty-six days, 27 per cent. of water. Suosequent exposure for thirteen days, in a warm room, evaparated 15½ parts of the water.

A similar stick of wood, exposed for the same time, but pressed at intervals, by a force of nearly fifty atmospheres, absorbed 118 per cent. of water. Of this, when the wood was exposed as above stated for the other piece of timber, there evaporated 21 parts.

The wood was not sensibly increased in bulk by the absorption of the water. The bulk of water absorbed in the second experiment having been nearly one thirty-ninth that of the wood.—[Annales des Mines, vol. vii.

From the Journal of the Franklin Institute.

SPECIFICATION OF A PATENT FOR IMPROVEMENTS IN THE PROCESS OF, AND APPARATUS FOR, DISTILLING SPIRITS OF TURPENTINE AND OTHER ARTICLES. GRANTED TO ISAIAH JENNINGS, CITY OF NEW YORK, AUGUST 27, 1835.

My improvement in the process when turpentine is to be distilled, consists in the addition of a portion of spirits of turpentine to the crude turpentine from which the distillation is to be made; the addition being made in such proportion as shall bring the turpentine into such a state of fluidity as shall admit of the subsidence of all the foreign matter contained therein as may be sufficiently heavy to fall to the bottom, and ot the rising of chips, and other light materials to the surface, whence they may be readily removed, and the clear turpentine poured off from the sediment. The quantity of spirits of turpentine to be added will depend, in part, upon the warmth of the weather, or of the place in which the mixture is made; and also upon the thickness of the turpentine to be operated upon, and the impurities which it may contain. The mixture and separation of the impurities may be promoted by artificial heat, care being taken that the temperature is not such as shall occasion a waste of the spirit by evaporation.

The apparatus which I employ consists of two vessels within each of which a still worm of the usual construction is to be contained; or instead of the worm any kind of heater, or refrigerator, by which analogous effects are produced, may be employed; these vessels are to be connected together in a way to be presently described, and one of them is to answer the purpose of a still, whilst the other is to operate as a refrigerator, or condenser. The prepared turpentine is to be contained in any convenient reservoir whence it may descend through a tube into the worm which is to operate as a distillatory, its flow being regulated by a stop-cock. The vessel containing this worm is to be closed at top, and the worm is to be heated by the introduction of steam, heated air, water, or other fluid; steam, however, being preferred; a sufficient degree of heat may be thus applied to separate the spirit from the rosin as the material descends from the top to the bottom of the worm. The lower end of this worm passes through the vessels, and into a large vertical tube which is placed between it and the refrigerator or condenser. This vertical tube rises as high as the top of the condenser, and descends several inches below the point at which the first named worm enters it, having below this point a tube for the discharge of the rosin, which, not being volatile, will descend and run out by its own gravity. Its flow may be regulated by a stop-cock, and may be promoted, if necessary, by the application of heat to the bottom of the tube.

The vapor of the spirit will rise towards the upper end of the tube, whence it will pass into the refrigerating worm contained in the condensing tube, down which it will pass, and be condensed in the usual way.

I intend to apply the same apparatus to the distillation of common tar, coal tar, and other analogous articles, diluting them also, with a portion of their own spirit, or with any other which will produce a like effect.

What I claim as my invention, is the preparing the turpentine for distillation by diluting it with distilled spirit, and separating by this means, the foreign matter therefrom, thereby producing a bright clear rosin, and an improved spirit. I also claim the employment of the worm, or other analogous apparatus, to be heated in the way described, and arranged and connected in the manner, or upon the principle herein set forth, so that it may answer the purposes for which it is ordinarily employed. I also claim the preparing and distilling of common tar, coal tar, and other analogous articles by dilution, and subsequent distillation in the same apparatus.

ISAIAH JENNINGS.

From the Journal of the Franklin Institute.

SPECIFICATION OF A PATENT FOR A MACHINE FOR SPREADING INDIA RUBBER UPON CLOTH.—GRANTED TO WILLIAM ATKINSON, LOWELL, MASSACAUSETTS, ATGUST 15, 1835.

The cloth to be coated with India rubber is to be made into an endless web, by sewing its two ends together; and other articles, such as skins of leather, may be coated therewith by spreading them on, and affixing them to, an endless web so made. This web is passed around cylinders which are made to revolve, and the dissolved caoutchouc or India rubber, is spread upon the endless web by the aid of a third cylinder, placed parallel to, and nearly in contact with, one of the cylinders around which the endless web passes.

The dimensions of the machine may, of course, vary, according to the width and length of the material to be coated or covered. In designating certain sizes and proportions of the respective parts, therefore, I do so only for the purpose of facility in description, and of indicating what has been found to answer well in practice.

I make a frame of wood, which may be sixteen feet long, and three feet six inches wide, the bottom timbers being sufficiently stout to support the carriage, and other parts, to be presently described. Into the ground sills, or lower part of this frame, uprights are mortised, which serve to support a rail on each side, which may be three feet four inches from the floor, leaving, however, the sills sufficiently clear within the uprights to form a railway upon which the rollers of a carriage may traverse back and forth.

Upon suitable supports, at one end of this frame, there are placed two cylinders of metal, usually of cast-iron, each of them one foot in diameter, and two feet nine inches long. The axes of these cylinders are in the same horizontal plane, and parallel to each other; around the inner cylinder the web to be coated passes; and the outer cylinder is made adjustable by means of screws, or otherwise, so that it may be brought into contact with, or removed to any required distance from, the web, or cloth. These cylinders are geared together by means of toothed wheels upon their shafts, cut sufficiently deep to admit of the requisite adjustment. The shaft of a pinion by which they are driven has on it a fast and a loose pully; when revolving they turn inwards.

The second, or carriage cylinder around which the endless web passes, is supported upon a carriage, furnished with wheels, or rollers, which run upon the lower rails, or sills. This cylinder is also to be made of metal, and when used as a drying cylinder, it should be large in diameter, say three feet. A windlass is placed at the back end of the frame, from which ropes pass to the cylinder carriage, serving, by means of a wince, to draw the carriage, so as to render the cloth taut. Steam is to be admitted into the cylinder through a hollow gudgeon. For this purpose a steam tube is attached to the gudgeon, its other end passing through a stuffing box in a larger tube, attached to a boiler, thus admitting of the requisite motion of the carriage.

In order to apply the solution of India rubber to the cloth, &c., and to confine it to the proper width, we fit two cheeks, or pieces of wood or metal, so as to rest upon the two contiguous rollers, one at or near each of their ends, and these, when in their places, convert the rollers into a trough, or hopper, for containing the solution. The distance of these pieces from each other is regulated by attaching them together by means of a frame, or rod, at their upper sides, so that they may slide, and be affixed in their places by thumb screws, or otherwise.

When spreading the rubber on the cloth it is necessary to prevent its adhering to the outer roller, and this, among other methods, may be effected, by means of wet sponges, or brushes, laid along it, or by keeping it wet in any other way.

I intend sometimes to use the drying and the spreading apparatus detached from each other, in which case but two rollers, of any convenient size, will be employed in the drying process, and steam may then be introduced into each of them. I intend also, sometimes, instead of the large drying cylinder above described, to cause the cloth to pass over a stationary metallic box, or steam case, in its passage from the spreading to the straining or carriage roller, making the upper surface of this case convex, that the cloth may be kept in close contact with it; the space between the two sides of such box, or case, need not be more than from one to two inches,

What I claim as my invention, and for which I ask letters patent, in the above described apparatus, is a machine for spreading India rubber upon cloth constructed, and operating, substantially, in the manner of that herein set forth. I do not claim the mere spreading of the substance by means of cylinders, this having been previously done, but we do claim the employment of two cylinders for the purpose, connected together, and made to concur, in producing this effect, acting upon the principles described. I also claim the general arrangement and application of the apparatus, for the drying of the solution by means of steam, either in combination with, or separate from, the spreading appparatus, as I contemplate the using of them either conjointly or separately, as hereinbefore set forth. I do not claim drying cylinders, or boxes, heated by steam, as my invention or discovery, but the combination and application thereof in the way, and for the purpose by me herein fully made known.

From the Journal of the Franklin Institute.

SPECIFICATION OF A PATENT FOR A MODE OF DESTROYING WEEVILS, IN GRAIN; TO EXPEL MOISTURE FROM GRAIN, MEAL, MANUFACTURED FLOUR, AND FOR DRYING MALT.—GRANTED TO JAMES A. LEE, ADMINISTRATOR OF JAMES LEE, DECEASED, MAYSVILLE, MASON COUNTY, KENTTCKY, AUGUST 17TH, 1835.

This improvement consists of one, or more, hollow cylinders, or prisms, made of sheet iron, or other metal, of any required dimensions in diameter or length. Fixed on an angle in an inclining position, in the manner of a bolting-reel as is used in mills for bolting flour; it is enclosed in an oven or arched room, made of brick, stone, or other material, sufficiently wide to contain one or more cylinders, or prisms, aside of each other, and of height sufficient to admit of one or more stoves, or flues, calculated to communicate to the cylinders, or prisms, the quantity of heat required for destroying the living insects and their eggs in the grain, and for thoroughly expelling the moisture from the grain, malt, meal, or manufactured flour; the cylinders, or prisms can be moved either by hand, or machinery; the grain, malt, meal, or flour, is introduced through a hopper at the upper end of the cylinder, or prism, and by its inclining position and revolutions it is carried to the lower end, where it is discharged; in its passage down, the grain and malt is kept rolling, the meal and flour is constantly kept in a floating, pulverized state, not subject to concretion, or coagulation, and to prevent the meal, &c. from adhering to the cylinder, or prism, and being subject to be burnt, I fix several combs on the surface of the cylinder, to raise strikers of sufficient weight or force, to jar the cylinder, so as to disengage the meal, or flour, that may adhere to it.

By the process in this improvement the living weevils, or other insects, will be killed, and their eggs destroyed; the moisture in the grain, malt, or manufactured flour, and meal, will be effectually expelled, so that when repacked into seasoned barrels, and stored in dry places, the grain, meal, or flour, may be kept sweet for years in the warmest climates, free from fermentation or putrefaction and the ravages of insects, and the malt dried as may be required, at the same time the germinated parts of the malted grain will be broken off by the revolutions of the cylinder, or prisms. It is not necessary that the meal or flour, should be cooled before repacking; the moisture being driven out, it cannot spoil, and may be suffered to cool in the barrels.

Now what I claim as new and as the invention of the said James Lee, deceased, for which I solicit letters patent, is the use of the hollow, inclined cylinder, cylinders, or prisms; and strikers, in connection with a chamber, or oven, heated by means of stoves, or flues, operating in the manner and for the purposes herein set forth and described.

In testimony that the foregoing is a true specification of my late father's invention, or improvement, I have hereunto set my hand at the city of Washington, in the District of Columbia, this 3d day of August, 1835.

JAMES A. LEE, Administrator.

From the American Journal of Science and the Arts.

MISCELLANIES—FOREIGN AND DOMESTIC.

1. ALUM may be used for ornaments, like alabaster. When of a proper degree of solidity, it may be wrought with tools, polished, &c. When melted by heat, it may be cast into pasteboard moulds, and then polished or wrought. While in a melted state, it may be colored to suit the fancy. If rubbed with an excaustic of yellow wax, the appearance of marble or alabaster may be given to it. (J. G.)

2. CEMENT. (J. G.)—Calcined and pulverised shells, mixed into a paste with coarse or refuse oil, makes a cement, used in India for stopping the joints of boats, &c.

3. A HEATER OR CALORIFACTOR, for preserving the heat of the body in attacks of cholera, or severe and protracted chills, is made with advantage, by forming a semi-cylindrical case of tin, which will cover the body when in bed, leaving an opening at one end for the neck, so that the head may protrude. This case is made double, with a space of four inches between the inner and outer sheet. One opening is left at the top, for the insertion of a funnel, through which hot water is to be poured, and another small opening for the escape of air. This case is to be pressed down, over the patient, when in bed, and the clothes packed round it. If covered with a blanket, it will, when charged with hot water, retain the heat a great while. It need not be *filled* with hot water. The steam which rises, keeps the upper part hot. The two sides should be connected by a tube, to equalize the flow of the water. In fifteen minutes the pulse has been raised from sixty-one to eighty-seven per minute. In rheumatism, and all cases in which sweting is indicated, this instrument may be effectually used. The water is drawn off by a stop cock at the bottom. (J. G.)

4. FREEZING MIXTURE. (J. G.)—Four pounds of pulverized sulphate of soda, (not efflorescent,) and three pounds of cold dilute sulphuric acid, (seven pounds strong acid and five pounds of water, mixed the day before using.) I have prepared by this process more than three hundred pounds of artificial ice.—BOUTIGNY. *D'Evreux.*

5. A good *Safe*, or victual preserver, is prepared, by making it of a double case of wire gauze, and filling the interval with fresh charcoal, in fine pieces. Fresh meat, when suspended by hooks from the top, will keep good and sweet for a week in this safe, in the hotest weather.—(J. G.)

6. Cure for Cramp. (J. G.)—A bar of iron, placed across the bed on which the person sleeps, under the mattrass, about as high from the foot as the calf of the leg, is said to be an effectual perventive. The bar may be an inch square. In defect of a bar, a poker or other iron will answer temporarily. If there be two mattrasses, it may be placed between them. This remedy was strongly recommended by Dr. Chretienne, of Montpelier, and has proved availing in a vast number of cases.

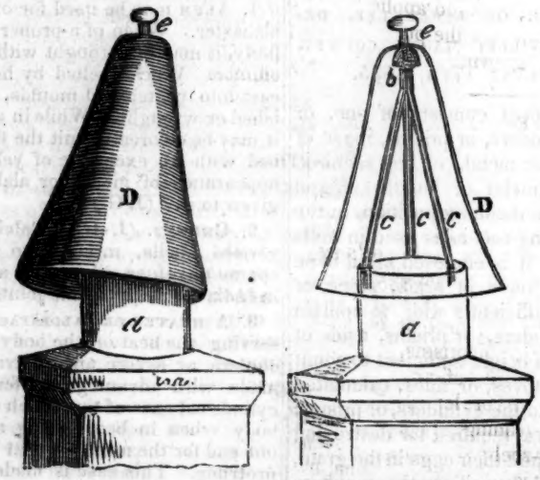
7. Excellent ink, and easily made. (J. G.)—Into a ten gallon keg, put three pounds of copperas, well pulverized. Take three pounds of logwood, and boil it in six or seven gallons of rain or pure river water, and when it has boiled half an hour add four pounds of nut galls, broken up, and a quarter of a pound of alum. After another half hour's boiling, pour the whole of the materials into the keg, stir the contents well together, and let it remain a week, stirring the whole several times a day. Then put into the keg half a pound of gum arabic, in powder, and one pound and a half of sugar candy. Leave the mixture a week longer, stirring frequently. After three weeks' rest and settling, the ink may be used at pleasure, growing better with age.

To keep it from moulding add a dram of cloves and cinnamon, in powder, with an ounce of anise seed.

To render the ink of a beautiful blue black, add to the above contents a quart of sulphate of indigo. The latter is prepared by taking a quarter of a pound of indigo, reducing it to small pieces, sprinkling a little water on it, and the next day add to it two pounds of sulphuric acid, and leave it to digest in a warm place.

8. To silver iron. (J. G.)—Add to a solution of silver in nitric acid, a portion of common salt. Wash the precipitate thoroughly on a filter, and let it dry. By rubbing this powder on the iron or steel, (previously coppered, by plunging it, with a clean surface, into a warm solution of sulphate of copper, and rubbing it with a polisher,) with a little cream of tartar, a coating of silver may be established, which admits of a fine polish.

9. Movable hood, for smoky chimnies. (J. G.)—The following is described as a simple and effectual cure for smokey chimnies.



The flue of the chimney terminates in a cylinder of cast of strong sheet iron, (*a*,) one foot in diameter, firmly set in the top of the masonry. Three light iron rods, (*c*, *c*, *c*,) rivited to the cylinder *a*, rise about two feet above it, and unite in a piece of iron, (*b*,) of a triangular shape, and three or four inches long, and having a hemispherical termination. The half ball has a hole bored in its upper part, at least an inch deep and one fourth of an inch in diameter, and well tapered to receive the screw *e*, which is provided with a good thumb piece. This screw holds the hood *b* in its place, and serves as its axis of motion.

The cono D is of sheet iron, two feet long and two feet in diameter. When at rest, its base is horizontal. It has a truncation or flatening at the top, four inches at least in diameter, with a hole for receiving the screw. It is made somewhat concave, and the hood must be so adjusted as to turn freely on its axis.

When the wind blows strongly, the hood is pressed against the chimney on the windward side, and the smoke freely escapes on the opposite side.

When the chimney is to be swept, the hood is unscrewed and removed for the purpose, if necessary.

When the wind is variable, the hood is liable to rattle against the cylinder, and occasion an unpleasant noise. This may be prevented, by punching holes round the cylinder, and attaching to it, by means of wire, a band of thick list or double piece of cloth. The hood must extend at least an inch below the top of the cylinder.

10. Method of coating Busts and Plaster Casts, so as to give them the appearance of marble; by M. Pleuvarre. (J. G.)—Into a wooden tub or trough, put a strong and warm solution of alum. Into this plunge the bust or plaster cast, previously made perfectly dry, and let it remain therein from fifteen to thirty minutes; then suspend it over the solution, that the superfluous portions may drain off, and when it is cold, pour over it a fresh portion of the solution, and apply it evenly by a sponge or cloth. Continue this operation until the alum has formed a crystallized coating over the whole surface. Put it aside, and when perfectly dry, polish it with fine sand paper, or glass paper, and complete the polish with a cloth slightly moistened with pure water.

A wooden vessel is best for the solution, warmed by steam from a boiler, because metals are apt to color the solution. This coating gives greater solidity to the substance, and possesses the whiteness and transparency of the finest marble. It stands the attacks of moisture in any apartment,—is less subject to become soiled, and is as easily cleaned as marble.

In this manner, excellent copies may be obtained of antiques, as well as moderns, at a price little exceeding common plaster casts.

11. Iron Cement. (J. G.)—The Fountaineers of Paris, make use of an iron cement, for uniting the stones which form their fountains. It is very strong, and may be employed in a variety of occasions.

Take one part of vinegar, and four parts of pure iron filings, stir them well together every hour for six hours, or until the mixture begins to form a good paste. To unite stones by this cement, clamps are to be first attached to the stones, which are to be very dry. The surfaces (of the stones,) to be united, need not be more than two lines (at farthest,) apart at the top, and to terminate below at the depth of five or six lines, at the distance of one line. The mastic once introduced into this space, the stones are to be pressed together, and the cement allowed to set. In a few hours, the surface may be polished, and the joint becomes as firm, as the stone itself.

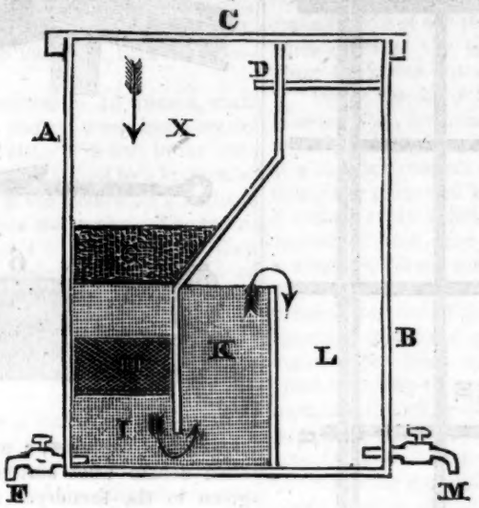
12. Filtration of Water for Domestic purposes. (J. G.)—Many families and individuals are subjected to great inconvenience and often to the injury of health by the use of impure water. The water of wells and springs, is very frequently impure, not only from the ingredients which it holds in solution, but from earthy and foreign matters suspended in it. From the former, that is, the saline and calcareous matters which are completely dissolved in it, and which render it hard and unsavory, it cannot be deprived by filtration merely, but from those foreign substances, which destroy its transparency and make it turbid and unpleasant, the filter is an effectual remedy. Besides, there are few dwellings, whether in situations where the well water is naturally hard and injurious, to those who drink freely of it, or otherwise defective, from which, with a little attention, rain water may not be caught in sufficient quantity to answer for cooking and drinking, and this when passed through the filter we are about to describe, is perfectly fit for these uses.

The cheapest kind of filter, and at the same time, one of the best ever used, is the following.

A B, is a wooden box made of pine plank, which should be previously boiled several times in water, to remove all the resinous, or soluble parts which give taste to the water. C is a cover with a rim, and D is a sliding board, to keep the filtered water from dust. X receives the water to be filtered, which first passes through a bed of coarse gravel G, terminating in fine sand, and then through a bed of charcoal H, coarsely pounded, and again through sand, resting on fine gravel I. From this, the water passes through an opening one and a half inches high, at the bottom of the partition, into the compartment K, which contains only fine sand. The compartment L, receives the filtered water, which is drawn off through the stop cock M. F, is a cock for emptying the machine when necessary for cleaning.

The sand and gravel must be carefully

washed before using, and the charcoal carefully selected and free from taste. If this box be nine inches square at the bottom, and thirteen inches high, it will be sufficient for an individual. Larger dimensions may adapt it to family use, and if made higher in proportion to its breadth than the above ratio, the filtration would be more thorough. The materials should be renewed once in five or six months, or oftner, if necessary.



13. To render Oil casks impermeable. (J. G.)—When the cask is new and ready to receive the oil, pour into it a concentrated and hot solution of sulphate of soda, (Glauber's salt,) spread it well over the whole interior surface by a sponge, cloth or broom, so that the wood may become thoroughly impregnated with the liquor. When it begins to grow cold, withdraw it, heat it again to boiling and renew the operation three or four times. Wipe off the superfluous salt with a coarse cloth, let it dry a few hours, replace the head, (the inside surface of which should have been treated in the same manner,) and it will be found that the pores have been effectually stopt by the salt, so that the oil may be safely introduced.

14. To purify cold short iron, a very simple process is practised in some bloomeries, which consists in throwing on the loupe at the moment when it is formed, half a shovel full of powdered flux, and keeping it afterwards exposed to the air of the bellows for a few moments, before it is carried to the hammer. The flux thus employed, is a limestone, which yields lime of good quality. Its effects on the loupe, are very prompt, depriving the iron of the siderite or phosphate of iron, which as is well known, renders the iron brittle when cold.—(J. G.)

15. Method of Bronzing Iron and Gun barrels. (J. G.)—Gun barrels when damasked, are less liable to rust, and any of them, of whatever price, may be treated by a very simple method, which will diminish their readiness to oxydize. When the iron is well scraped and cleaned, cover its surface with a coating of butter of antimony. If one is not sufficient, two or three coatings may be given. The iron thus acquires a horny reddish brown color, which is not unhandsome, and which preserves it from rust. When the iron has acquired the desired tint, wipe it carefully, warm it a little and then rub it with white wax, until there remains no longer any visible traces of the wax. This renders its preservation complete.

18. Introduction of Burden's Boat into France. (O. P. H.)—Baron *Seguier*, member of the Institute, has constructed a boat after the plan of Burden's, of two double cones, one hundred feet long, with the engine between them, which with the boiler presents some improvements.

M. *Cave*, a mechanical engineer, has also constructed a double boat, for the navigation of the canal of Somme. It differs from the preceding in being open at the surface covered with a flooring and has two keels and two helms.

A similar boat has been constructed for the navigation of the Loire, between Nantes and Angers.—[Bul. Soc. Enc. l'Ind. Nat.]

Report on Cotton.—A very valuable report has been made by the Secretary of the Treasury on the cultivation, manufacture, and foreign trade of Cotton, which comprises a mass of information which is not less interesting than valuable. From a table in this report we learn that in 1791 the capital employed in connexion with the growing of cotton in the United States, was 3½ millions of dollars; in Brazil, 33 millions. Ten years after, the capital employed in the United States, was 80 millions; in Brazil, 50 millions. In 1811, capital employed in the United States, 134 millions; Brazil 58 millions. In 1821, capital employed, United States, 300 millions; Brazil, 83 millions. In 1831, capital employed, United States, 650 millions; Brazil, 58 millions. In 1835, capital employed, United States, 800 millions; Brazil 50 million.

The following table, which we extract from the report, shows the items which make up the capital employed:—

1st. The capital invested in cotton lands under cultivation, at two million acres, and worth, cleared, on an average, $20 per acre, is	$40,000,000
The capital in field hands, and in other lands, stock, labor, &c., to feed and clothe them, at $100 per year, on 340,000 in number, would require the interest or income of a capital, at six per cent., of	544,000,000
The maintenance of 340,000 more assistants, &c., at $30 each per year, would require the income of a capital, at six per cent., of	167,000,000
The capital to supply enough interest or income to pay for tools, horses for ploughing, cotton, taxes, medicines, overseers, &c., at $30, for the first 340,000, would be	167,000,000
Making in all a permanent capital, if so used, equal to	$918,000,000
2d. The capital in cotton lands, as stated above,	$40,000,000
Capital in the purchase of 340,000 field hands, at $800 each, on an average,	272,000,000
Capital in the other 340,000 to aid, and to raise food, clothing, &c., at half price,	136,000,000
Capital in horses, cattle, sheep, utensils, &c., for plantation about $30 to each person, to aid in making food and clothing, &.,	20,400,000
Capital in other lands to support stock, raise corn, &c., at 20 acres to each of the 680,000, worth $20 per acre, cleared,	272,000,000
Capital, temporary, or floating, to buy clothing not made on plantation, pay taxes, overseers, freight, tools for cotton, &c., $45 each, to	30,600,000
	$771,000,000

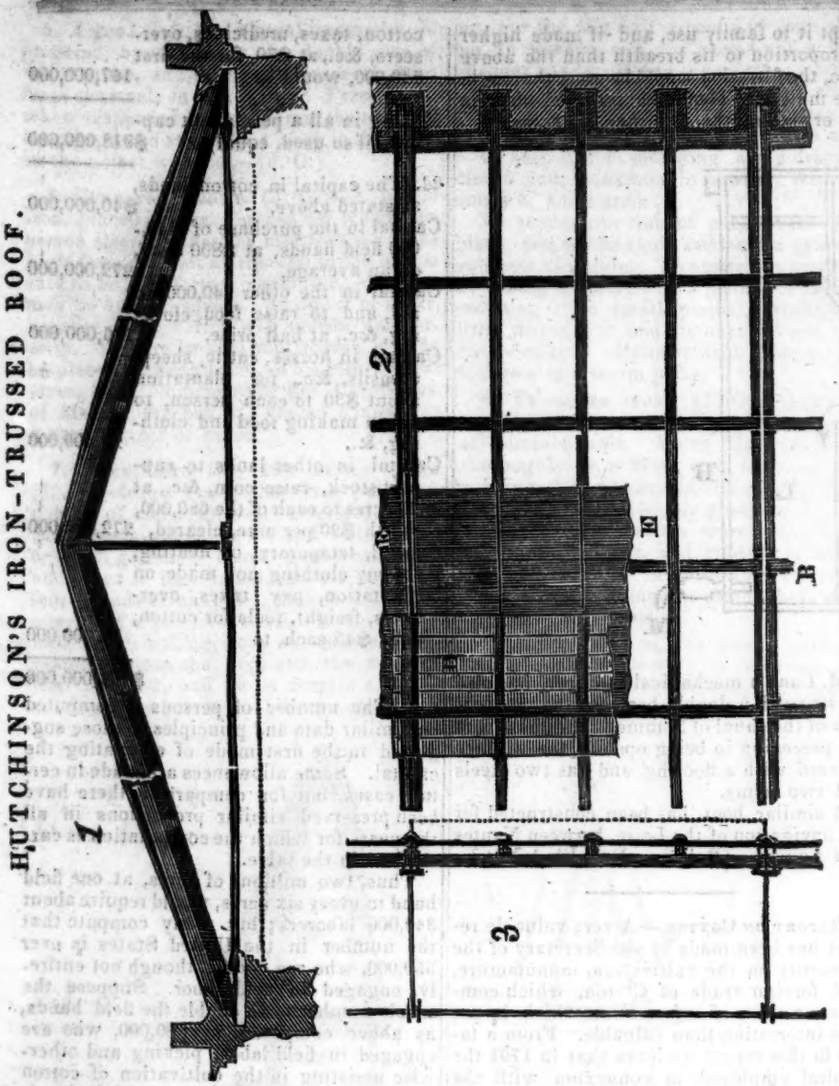
4. The number of persons is computed on similar data and principles to those suggested in the first mode of estimating the capital. Some allowances are made in certain cases, but for comparison there have been preserved similar proportions in all the years for which the computation is carried out in the table.

Thus, two millions of acres, at one field hand to every six acres, would require about 340,000 laborers; but many compute that the number in the United States is over 550,000, who are chiefly, though not entirely, engaged in field labor. Suppose the whole number to be double the field hands, as above computed, or 680,000, who are engaged in field labor, picking and otherwise assisting in the cultivation of cotton and corn, and the estimate of laborers is complete at about 680,000. But allowing that a number more should be added, who are connected with the cultivators, as infirm women, very young children, and too aged persons, &c. unable to labor in the field, besides overseers, owners and their respective families, dependent on the cotton crop, and it is presumed that then a million of persons would be considered as now engaged in the United States, directly and indirectly, in the growing of cotton; but the actual laborers are only about two thirds of that number.

Gold Mines in the United States.—In the ten years between 1824 and 1833, the income from the North Carolina mines increased from four thousand dollars a year to four hundred and seventy five thousand. Since 1833, the income from that State has slightly diminished. The territory in North Carolina in which gold is found, is of small extent, and it is said that the deposit mines of Virginia, North Garolina and Georgia, will be exhausted in a few years.

During the months of December and January last, the average number of persons who passed from Brussels to Malines, by the Railroad, was never under 800 every day. The total number of passengers in December was more than 28,000, in January more than 29,000; this will probably be surpassed in the present month.

HUTCHINSON'S IRON-TRUSSED ROOF.

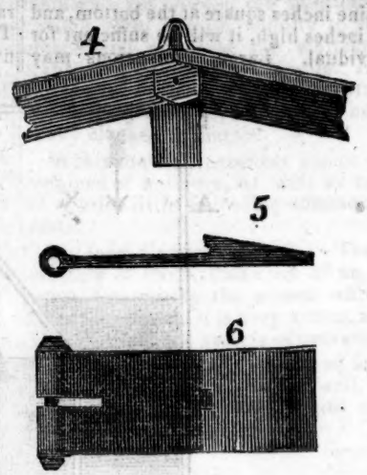


DESCRIPTION OF AN IRON-TRUSSED ROOF, CONSTUCTED OVER THE BORING-ROOM OF THE NEW GUN-FOUNDRY AT COSSIPORE, BY MAJOR G. HUTCHINSON, ENGINEERS, F. R. S., SUPERINTENDENT AND DIRECTOR OF THE FOUNDRY.

We extract the following description of this remarkable roof from the last volume of the *Journal of the Asiatic Society*, at the suggestion of an esteemed correspondent, to whom we feel much obliged for directing our attention to an article fraught with so much interest to our mechanical readers. Both the design of the roof, and the manner of carrying it into execution, do infinite credit to Major Hutchinson, in whom English science, and English mechanical skill, have found in India a most fit representative.—[London Mechanics' Magazine.]

"We have requested Major Hutchinson, of the Engineers, the architect of this elegant structure, to favor us with drawings of its various details, that we may make known as far as the circulation of our Journal permits, his very successful combination of the cast iron trust with a wrought iron tie to roofs of large span in this country. We are so little accustomed to see any thing else in India but the heavy flat roof with its massy timbers groaning under an inordinate load of terrace-work heaped up most disadvantageously in the center to allow a slope for the water to run off, while the invisible white ant is cooping out the solidity of the timber, and the dry rot is corroding the ends that support the whole on the wall,—that the eye rests with quite a pleasurable sensation on the view of a light, airy framework, like that before us, composed of materials indestructible, wherein the strains and pressures are counterpoised, the load lightened, the liability to crack and leak lessened, and the repair of every part rendered easy and entirely independent of the rest.

"The progress of improvement is notoriously slower in Government operations than in private works. When cast iron beams were first brought to India on private speculation, and were offered to Government by a mercantile house in this town, they were rejected. The roof of a large private go-down was soon after constructed with them and their efficacy thus proved; then immediately a re-action took place, and a large quantity was indented for by Government. The Hon. Court sent them out, and they have remained until now totally unemployed, although numerous public buildings have been erected since they arrived.



"It was, we know, a subject of lengthened debate what sort of roof should be given to the foundry. A timber trussed roof had been sanctioned at 15,000 rupees, and we may, perhaps, rather attribute the substitution of the present one to the numerical reduction of the pecuniary estimate, than to any actual conviction of its superiority in other respects, for the beams being already provided, the whole cost of the present roof, exclusive of them, has been only rupees 11,000.

"The new foundry, or rather the room in which the cannon are turned and bored, is a spacious hall, of 169½ feet long by 50 feet clear span in breadth, and 40 feet in height from the floor to the vertex of the roof; entirely open from end to end, lighted by a range of upper windows, and surrounded by a suite of apartments of half elevation. The steam machinery of the several borers and lathes is arranged along one side of this room, in a compact and exceedingly neat manner. It is impossible to attempt its description; those who are fond of mechanical inventions, will be amply gratified by an inspection of the whole, especially by the ingenious contrivance for adjusting the angle of the slide rests and cutters, for the exterior bevil of the gun:—the circular revolving tools for turning the trunnions;—the crane carriage for the guns, &c.

"The self-acting principle by which the exterior of the gun is turned, while the interior is bored, so as to save one-half of the time, while it insures perfect concentricity of the outer and inner circles, is, we believe, an invention of Major Hutchinson's, who took the opportunity when on furlough, of visiting some of the principal foundries in Europe, and studied to adopt every improvement suggested by their inspection.

"The whole apparatus is driven by two small engines of 10 horse power, which also work a circular, and reciprocating, saw, and a loam-mill for the casting moulds of the foundry, &c.

"The superficial area of the hall is 8,462 square feet; to form an idea of this magnitude, it may be mentioned that the

noble edifice of the new town hall in Birmingham, is said to contain a larger space than any room in Europe, and will accommodate between three and four thousand persons sitting or ten thousand standing; that room is 140 feet long, by 65 feet broad, making a superficial area of 9,100 feet, which is only 638 feet more than the Kasipur apartment.

"The roof consists of 10 trusses, each composed of a pair of cast iron beams pitched at an elevation of 6 feet in the vertex, and tied together at foot by a horizontal chain supported in the centre by a vertical rod suspended from the angle. The truss-frames are 15 feet 4·6 inches apart: they support light cross-beams and rafters of wood, upon which the planking of the roof is nailed. The weight of one truss with its entire load and chain is equal to about five and half tons, diffused over the two iron beams.

"The chain is 3 inches deep by 1 inch thick, = 3 inches in section, consequently the applicable force of tension of the chain is 3×9=27 tons, and the ultimate strength of it 3×27=81 tons. The above weight of five and half tons diffused over the two beams=2¾ tons on each beam, gives, according to the sine of the angle of elevation, a tension on the chains of about five and a half tons, or only one-fifth the stretching weight, or one-fifteenth of the ultimate strength of the chains.

"The iron beams and chains were all proved before they were put up, by suspending for several days without effecting the slightest apparent alteration, a weight of six tons from the vertex, producing a trial tension of about 12 tons, which is more than twice the actual tension.

"Each extremity of the tie-rods is bolted to a kind of shoe, resting upon a stone slab on the wall, into which the lower end on the iron beam abuts.

"The longitudinal tie-rods are united by a bolt, having two right-hand screws, passing through the central coupling plates of the chains, and the eye of the suspension vertex rod. This rod being firmly attached by two bolts through the beams at the vertex, any derangement whatever of the roof, either vertically or horizontally, is effectually prevented. At each end of the roof the longitudinal rods pass through the walls, to which they are firmly fixed.

"The horizontal overlaps of the copper sheathing are cemented with white lead, and the copper passes over the wooden battens fixed on the planks, to which only the copper is fastened by copper rivets; a copper cap or ridge-tile lies over the whole length, to prevent the insinuation of water at the fold; it answers this purpose so effectually, that the roof was every where found perfectly water-tight, during the late heavy season of rain, the first it had experienced.

"The Kasipur roof was set up without the assistance of any scaffolding from below. An experimental truss of timber supported on chains, having been previously made to show the advantageous application of iron chains instead of tie-beams of timber to rods of so large a span, it was converted into a platform, moveable upon wheels along the top of the walls, upon which, by means of a crane fixed at one end of the frame, the iron beams and every thing else was easily and expeditiously raised and fixed; the beams, &c. for the opposite side of the roof being passed upon wheels across the platform. The whole frame-work was put up in twenty days.

"Before closing our short account of the Kasipur roof, we must notice a curious optical deception, for which we are somewhat at a loss for a correct explanation. On entering the room and looking up at the roof, it strikes every beholder that the roof has somewhat sunk, and the horizontal tie-rod is about five or six inches lower in the centre than near the walls. So firmly impressed were we of this being the case, that standing at one end of the room, and holding two flat brass rulers, overlapping one another, before the eye, we could readily measure the apparent angle of the tie-rod, by raising the ends of the rulers so as to coincide with the two halves of tie-rods. On mounting the roof and looking in at the upper window of either end, the same effect was still visible, though in a diminished degree, and we were not convinced that it was a deception, until Major Hutchinson, at our request, caused an actual measurement to be made by a perpendicular wooden batten, from an accurately adjusted level on the stone floor. It was then proved that there did not exist a difference of level even to the amount of a tenth of an inch. Whence arises the illusion? Is it that the eye, judging of directions by comparison with other objects, and having the numerous lines of the pent roof inclined in opposite directions to each half of the horizontal rods, is thus perplexed in its estimate; the ruler experiment is opposed to such an explanation. It may, perhaps, be owing to the effect of light from the upper windows, which frequently gives a curved appearance to wooden beams from the decrease of illumination from side to centre. If the phenomenon resemble the effect of the eyes in a portrait always looking the same whencesoever viewed, or the curves formed by spokes of a wheel passing a railing, as has been suggested, the effect should admit of a rigid explanation, and we may hope to obtain it from some one of our readers who may have time to investigate this singular deception."

Description of the Engravings.

Fig. 1, is a section of the roof. Fig. 2, a plan. Fig. 3, a longitudinal section through the vertex A B of fig. 2. Fig. 4, a transverse section through B C of fig. 2. Figs. 5 and 6, section and plan of the ron shoe. D, in fig. 2, is the copper heathing; and E E, the planks.

The following arrangement, if carried into effect, will certainly exhibit "reform" in the Post-Office Department.

From the Baltimore Gazette.

We are gratified to learn that an arrangement has been made by the Post-Master General for conveying the mail between Washington and Baltimore on the Railroad, and that further arrangements have been made for the transportations of the mails both southerly and easterly from Washington which includes the whole distance between New York and New Orleans, as stated in the following schedules.

GOING SOUTH.

Leave Washington	at	3	A.M.	
Arr. at Richmond	by	7 1-2	P.M.	16 1-2 hrs.
" Halifax	by	12	noon	16 1-2 do
" Fayetteville	by	10 1-2	P.M.	34 1-2 do
" Cheraw	by	3 1-2	P.M.	17 do
" Columbia	by	4 1-2	P.M.	21 do
" Augusta	by	6 1-2	A.M.	18 do
" Milledgeville	by	5	A.M.	22 1-2 do
" Columbus, Ga.	by	2	P.M.	33 do
" Montgomery	by	1	P.M.	23 do
" Mobile	by	9	P.M.	56 do
and at New Orleans	by	10	P.M.	25 do

Time from Washington to N. Orleans 283 hours, or 11 days and 19 hours.

RETURNING.

Leave New Orleans	at	10	A.M.	
Arr. at Mobile	by	11	A.M.	25 hrs.
" Montgomery	by	5	P.M.	54 do
" Columbus	by	2 1-2	P.M.	21 1-2 do
" Milledgeville	by	11	P.M.	33 1-2 do
" Augusta	by	8	P.M.	21 do
" Columbia	by	2 1-2	P.M.	18 1-2 do
" Cheraw	by	12	noon	21 1-2 do
" Fayetteville	by	3	A.M.	15 do
" Halifax	by	1 1-2	P.M.	34 1-2 do
" Richmond	by	5	A.M.	15 1-2 do
and at Washington	by	10	P.M.	17 do

Time from N. Orleans to Washington 276 hours, or 11 days ahd 12 hours.

Going north-east from Washington the mail will leave that city at three o'clock, A. M. by Railroad; it will leave Baltimore at half past six, A. M. by Steamboat; it will leave Philadelphia at four, P. M. by the Camden and Amboy Railroad, and arrive at New-York at eleven the same night.—Travellers can thus pass from Richmond to New-York in 42 hours, and from Baltimore to New-York in 16½ hours.

SOWING CLOVER SEED.

Extract of a letter from a subscriber at Cayuga: "As the time for sowing clover seed is approaching, some note in your paper of practical farmers on that subject may be of some service, and save some the trouble of complaining of the loss or failure of their expected crop of clover. For several years past I have practised sowing my seed the last of March or 1st April, when we have frosty nights and thawing days. The mornings then are generally still—the surface of the ground is raised by the spars of ice formed during the night—and if the seed is cast on the ground such mornings, it finds its way through the crevices occasioned by the ice beneath the surface of the earth sufficiently deep to protect the young plant from the drouths of April or May, by which our clover crop is frequently destroyed, if the seed is sown when the surface of the earth is compact. Since I have practised in this way, I have not failed in a single instance of having a full crop of clover."—[Genesee Farmer.]

The schooner Indiana, which was prevented by the ice from getting into the Detroit River last fall arrived yesterday, freighted with a large quantity of merchandize for merchants in Detroit and in the country. The Sandusky, also arrived from Sandusky, freighted with pork, lard, butter &c, &c., consigned to Brewster, Smart & Co. and the owners on board.—[Detroit Journal.]

Rapid Travelling.—A train of 6 carriages was lately conveyed on the Greenwich Railroad in England, sixty miles in one hour—or at the rate of a mile a minute.

THE HORRORS OF CIVIL WAR.

The following sanguinary incidents of the horrible warfare between the present Government of Spain and the followers of Don Carlos, under their celebrated leader Zumalacarregui, are extracted from a work recently published by an officer (Captain Henningsen) who served in the Carlist army, under their inexorable leader:

'I will give an example of cruelty exercised against Zavala, beyond what Europe would believe, of the modern ages and of the party who profess to desire nothing but the improvement of Spain. Having, when pursued, sometimes obstinately defended himself, his two daughters, who had fallen into the hands of the Christinos, were dragged about, and always carried forward with the trailleurs in every encounter by the garrison of Bilboa, which had daily skirmishes with him. Zavala, fearful of injuring his own children, was obliged to prevent his partisans from returning the enemy's fire, and precipitately to retreat. At length, driven almost to desperation between the reproaches of his party and his paternal feelings, he sacrificed the latter to his duty; and having harangued his followers, placed them in ambush near a little village between Guernica and the sea. The enemy being informed of this circumstance, advanced along the road, leading forward as usual his two daughters Zavala, in a firm voice, but with tears in his eyes, ordered his men to open their fire; and instantly rushing on with the bayonet, was fortunate enough to recover his children unhurt; they had, however, narrowly escaped, two of those who held them being killed by the first discharge. His devotion was rewarded with victory; the enemy was dispersed and routed.'

Captain Henningsen has a striking description of the battle, or series of skirmishes, in which Quesada was finally discomfited. The Queen's general owed his own escape solely to the gallant devotion of Colonel Leopold O'Donnel, Conde de Labispal, a nobleman of Irish extraction, who *happening* to fall in with the army when travelling to Pampeluna, where a young and beautiful heiress was waiting to become his wife, had volunteered his services for the day, and headed a company of huzzars of the Guard. O'Donnell was one of the many who fell into the hands of the Carlists.

Last but not least of the prisoners taken was the Count Labispal—gallantly but vainly struggling to rally his men, he was surrounded by the Navarrese. Hitherto the Carlist prisoners had been shot as rebels, and the Christinos had suffered death by way of reprisal. Zumalacarregui, anxious to put an end to this dreadful state of things, set at liberty, and caused to be escorted as far as Echaori, five miles from Pampeluna, two soldiers who, unable from fatigue to follow the march, had been taken from Quesada's column. The next time Quesada sallied from Pampeluna, he requited the mercy of the Carlist general by shooting in Huarte d' Arquil a wounded volunteer, and putting afterwards to death the alcalde of Atoun, who was suspected of Carlism, as well as several other individuals. Zumalacarregui now wrote to the General Count Armilde de Toledo, to state 'that since the chiefs appointed by the usurping government were unwilling to make any arrangement for the preservation of the lives of their respective followers—although he had several times set them the example of clemency—the blood of those that perished must be now on their own heads.'

'He kept his word: of all the prisoners who were executed, perhaps the fate of Leopold O'Donnell was the most melancholy. He perished through that valor which seems an heir loom in his family, and sacrificed himself to save Quesada and his staff. He offered, if Zumalacarregui would spare his life, to pay a ransom that would equip all the battalions of Navarre; but knowing the necessity for making the example, the chief remained inexorable. He died with his brother officers of the Guards, in a manner which added another example to the many, that often those who have enjoyed a life of luxury and pleasure, and to whom it still holds forth bright prospects, can relinquish it with the least regret. His father, the Count of Labispal, celebrated both during the triumphs of Wellington and the revolution of 1823, callous and heartless as he had been throughout his political career, was doomed to prove, on hearing the death of his son, that there was still one point where his sensibility was vulnerable. He died of a broken heart at Montpelier, where he had been long residing. In his changes of principle, this elder Labispal had been the Talleyrand of Spain.'

We must next extract part of our author's chapter of the battle fought between Zumalacarregui and O'Doyle, nearly on the ground of the Duke of Wellington's illustrious triumph at Vittoria.

'It was now destined to become the scene of a signal overthrow of a division of the regular army of Spain by a handful of enthusiastic mountaineers. At Zuniga, accounts of the last devastations of Rodil, the burning of villages and cottages, and the massacre of the wounded Carlists, had reached our army, and had worked them up to a degree of excitement which accounts for their impetuosity.—The great difficulty was to keep them in something like order. Their loud cries of *Aellos! Muera la Reina!* were vigorously answered by the enemy, as well as their fire; but as they advanced in spite of the volleys of musketry which the whole line of the Liberal army were pouring in, their replies waxed fainter. The order which the Carlists preserved, with their impetuosity, their martial bearing, their wild shouts, and the black flags with a death's head and cross bones, seemed to have had an appalling effect. * * *

'The slaughter continued till nightfall, the enraged Royalists giving no quarter—and the night coming on alone saved the miserable remains of O'Doyle's army. About four hundred made their way to the village of Arieta, where they shut themselves up in the houses. About a thousand were killed, the field for two miles being covered with their dead bodies—the miserable wretches being dragged from the woods and thickets, in which they attempted to conceal themselves, and slaughtered by their angry opponents. I remember seeing twelve dead bodies lying together at a ford of the rivulet between the field and the road.

* * * * *

'The pursuit had continued so late that the greater part of our army was obliged to sleep on the field, and we bivouacked amongst the dead. In the meanwhile, a part of the third battalion of Navarre was detached to attack those who were in the village, where they had barricadoed the houses. After firing all night, the Christinos not choosing to surrender, a quantity of combustibles were collected, and placed against the houses. In the morning, the Christinos sent a flag of truce to the captain who was charged with his company to set fire to the piles, and stated that they had got the curate, the regidor, and a number of the principal inhabitants, with their wives and children; and that if the Carlists attempted to burn them out, they would commence by putting all these to death. The captain, who was a Frenchman, by the name of Sabatier, sent to Zumalacarregui to know how to proceed. The Carlist general determined to blockade them the next day; as they were entirely without provisions, he knew that hunger would force them to surrender. Eighty-four prisoners were brought in which the soldiers had made when tired of killing, for excepting these few cases no quarter was given; even two chaplains of the queen's army had been slain on the field. It was supposed that, according to the existing regulation, they would all suffer death; they were, however, remanded, and next day pardoned. O'Doyle, the general of the division, his brother, a captain, and several officers, were, however, shot. Zumalacarregui was inclined to have pardoned him; but amongst the despatches intercepted a few days previous were the minutes of a court martial held at Vittoria, in which O'Doyle had given orders for shooting the wounded prisoners. These papers had not yet been destroyed, and the circumstance of the part O'Doyle had taken in this transaction was mentioned to Zumalacarregui: this sealed his fate.

'O'Doyle behaved like a brave man on the field, but with less firmness afterwards. As he was being led up as a prisoner, a Carlist officer was mean enough to make some insulting observation. O'Doyle replied, "You are bearing arms, but you have never been a soldier, or you would know that a real soldier obeys his orders if they come from Hell itself." The officer was more severely reprimanded by the murmurs of the bystanders. O'Doyle, the next morning, begged to see the general, and when admitted to an interview, said he was a soldier who fought for those who paid him; that the fate of war had thrown him into the hands of the Royalists; and that he would serve them, if admitted to that honor, as faithfully as he had served the Queen. Zumalacarregui answered him briefly, that it was out of his power to spare his life.—He then began to implore with clasped hands, "*la vida, por Dios! por Dios!*" Zumalacarregui turned his head away in disgust, and said, "*A confesar luego!*" and the wretched man was led out, and, after being half an hour with his confessor, shot; as well as his brother and other officers. His execution took place on the very spot where he had been defeated; his fortune and his life both taking wing on the same spot. Poor O'Doyle's was a melancholy fate, but it is impossible to deny the singular retribution of his punishment.'

Perhaps the next anecdote, which is so characteristic, in all respects, of the man and the country, that we could not omit it, leaves a more painful impression than any other one page in the book.—Count Via Manuel, a Spanish grandee, holding high rank in the Queen's army, fell into Zumalacarregui's hands at the close of one of those bloody battles among the woods of the Navarre. The frank and open manners of this nobleman confirmed the favorable impression which Zumalacarregui had received from witnessing his conduct in the field. He was in truth a rare example in his order, of high minded courage, and he had never been suspected of being biased by any unworthy motive in the choice of his paty. The Carlist General had lost the day before a favorite officer of his staff, and two or three volunteers besides. He proposed to write to Rodil, offering the captive grandee in exchange for these prisoners: in the meantime he invited Via Manuel to dine daily at his own table at head quarters—took him out with him on horseback—in short lived with him as a friendly guest; a week elapsed———

'They were at dinner at Lecumberri when Rodil's answer was brought in to Zumalacarregui; that note contained only the following sentence:—"The rebels taken have suffered death already." This was clearly the sentence of the prisoner. Zumalacarregui handed it over to him with the same sang froid with which he probably would have received it, had it been the messenger of his own fate. Via Manuel changed color. His host politely but firmly expressed his regret at being obliged to perform so unpleasant a duty, but informed him that he might be with his confessor till sunrise. His life had been spared so long, that this intelligence came like a thunderstroke on the unhappy grandee. At his request, Zumalacarregui consented to delay his execution, while he sent a messenger to the King entreating his clemency. He returned with the answer, that when soldiers and officers of inferior rank, taken with arms in their hands, had suffered death, it was impossible to pardon a Spanish Grandee. Via Manuel was shot at Lecumberri, but did not die so well as his deportment at first announced; probably it was the shock of the sudden disappointment, after he had so long entertained hopes of life, which had unnerved him.'

'I must not omit to mention a singular instance of fidelity. Shortly after his death, a sergeant, as he stated himself to be, and his galons indicated, deserted over to us, and was placed in a company of *guides;* he afterwards surprised and stabbed a sentinel and disappeared. We were informed by other deserters afterwards, that this very individual was a servant of Via Manuel's who took this mode of communicating with his master—but arrived a day too late; and, having acquired the certainty of his execution, on the first opportunity carried back the news of it, and some relics of his lord, which he had bought from the soldiers who had shot him.'

Surely, in spite of all Rodil's cruelty, and the cold bloodedness of its announcement, Via Manuel had tasted the salt of his captor; and even an Arab robber under such circumstances would have considered the sacred law of hospitality as infrangible. If, however, Don Carlos was exactly aware of the reception which his general had given to the Christino grandee, his royal highness's answer to Zumalacarregui's appeal is still more painful to think of than the *hesitation* which prompted that appeal.

We have 'supped full with horrors'; but' still there is one scene of considerable extent which must be given before our reader can have completed his notion of these barbarous people. In a village just within the border of Navarre, a small garrison of Christino Urbanos—men recently drafted from the National Guard of some town in the South—had established themselves, and were levying heavy contributions upon the monasteries, besides doing bloody execution occasionally among the scattered peasants of what Zumalacarregui con-

sidered as his own proper domain. The country people flocked in with urgent entreaties for his interference to rid them of this annoyance—he did not require much persuasion; but the enemy's columns were hovering about; Zumalacarregui had but a small force with him at the time; and the attempt must at least have been delayed, but for the zeal of a veteran smuggler, Ximenes, who, with a sturdy youth, his son, offered to conduct a detachment by a safe byway.

'I shall never forget,' says our author, 'one old woman, dressed almost in rags, her grey hair floating dishevelled about her neck, who came up to the captain of a company with whom I was in conversation, and probably mistaking him for a superior officer, doubled her shrivelled hand in his face, and shrieked out a volley of insulting epithets, which she concluded by invoking "*La maledicción de Dios*" on all our heads, if we retired like *falsos*, and left a single one of the *blacks* alive. Having inquired of a bystander who was this fanatic? we were informed that she was an old weaver, of a neighboring village, whose only son had been shot that day fortnight—having been dragged from his bed by some of the Urbanos; it was supposed for having carried tobacco to the Carlists.'

The detachment approached the village, and found that the Urbanos had fortified themselves in the church—while *Ximenes* made the discovery that *his own eldest son* was their commandant!—Forthwith,—

'The two four-pounders taken at Vittoria, and which at that time were all the artillery, were brought to bear on the church-gates, which were lined with heavy sheets of iron. The gates having been burst open, with the loss of three men wounded only, our volunteers rushed into the church, but they were only able to surprise one or two of the enemy, the rest having retreated into the steeple, of which the staircase had been broken away, and where they had most strongly barricaded themselves. As they obstinately refused to surrender, and it would have taken too long to undermine the massive walls of the old steeple—in which act the approach of some Christino column would probably have interrupted us—it was resolved to set fire to it. Piles of wood, tow, goat-skins full of brandy, and other inflammable matter, were piled at the foot of the steeple, from the interior of the church; and the Baron de Los Vales,* having just arrived, was entrusted with the commission of setting fire to it. The besieged had no doubt of being relieved before day break, and therefore were loud in their jokes against the Carlists, to whom they called out, "Mountain thieves! sons of monks! rebels! you will soon have to run back to your mountains—the columns are advancing.'

Night closed in—but it brought no intermission of the assault—by and by—

'The shrieks of some who had taken refuge in corners of the building where they were reached by the flames, as well as the women and children who saw the devouring element raging below, were heard at intervals; and although orders were given to fire only on the men, it was often impossible to distinguish the dark figures that flitted before the light, endeavoring to breathe an instant out of the smoky atmosphere. It was repeatedly proposed to them to let the women and children out, but this they refused. The bells had all fallen in, and packets of cartridges were constantly exploding. Towards morning a few faint cries of "*Viva el Rey!*" were heard from the women, and the commandant of the Tower inquired if quarter would be given them? He was answered "No; the men had none to hope for." He then inquired if it was Zumalacarregui who had besieged them, and which was he? The general had just arrived, and most imprudently went beyond the corner of the church, exclaiming "*Aquiestay!*"—Here I am! The commandant then said they could bear the heat and smoke no longer, and asked if they would be allowed the consolations of religion before they suffered death. Zumalacarregui replied, that the Carlists had never denied that yet, but not to flatter themselves with the hope of mercy. The commandant then answered, that they surrendered. But how men who had defended themselves desperately, and who had no chance for their lives, missed the opportunity of shooting the Carlist leader, who was not above fifty yards from them, firing downwards, when it is so much easier to him, and a bullet carries so much straighter than in a horizontal direction, has always been a matter of surprise to me, particularly as several shots were fired afterwards by them.

'When ladders were placed to the church roof, and the volunteers went up to receive their arms, they shot one soldier, and an officer was wounded; the men who had fired were bayoneted on the spot—one in particular, who defended a narrow ledge, and was struck in the breast by a volunteer, fell from the top to the bottom of the steeple headlong at our feet; the rest made no resistance. Three women (one a Carlist prisoner) and four children had perished, and above thirty of the garrison, either by the smoke or the flames, or the shot of the assailants. Those that remained were so blackened by the smoke, that they presented a most ghastly appearance, when, with considerrble difficulty, they were got down over the roof of the church, which, although the steeple was burning for ten or twelve hours, had never taken fire. The commandant and his lieutenant were brought before the general, who inquired whether the garrison had been acting all along by their orders. The commandant hesitated, but the ex-schoolmaster boldly replied, 'Yes: they acted by our orders.' The former was a short man, about four-and-thirty, his form athletic and his bones all thickly set; he was dressed in blue trowsers and zamarra. The smoke to which he had been all night exposed, had swollen his eyelids and darkened his face. *This was the son of Ximenes;* on the whole, he presented the idea of a bold and determined ruffian. The schoolmaster, who was also below the middle stature, had an open and prepossessing countenance, and he behaved in every respect with the firmness of a man; while the captain occasionally betrayed signs of weakness, which I should scarcely have expected after his gallant defence, for such it incontestibly was.

'"Have you any thing to say in your defence?" inquired the general. The reply of the lieutenant was, "That he neither begged for mercy, nor did he suppose it likely that pardon would be granted him. They might, however, do worse than let him live; he had no affection either for the Queen or for Don Carlos, but where chance had thrown him, that party, as they had seen, would he serve; if they chose to try him, and let him live, he would serve the King like a soldier; if they shot him, like a soldier he would die.' 'And you?' said the general to the captain. 'I only surrendered,' replied Lorenzo Ximenes, 'because I was promised quarter; if not, I should have held out longer.—You may judge from my behavior whether I would not have perished in the tower if I had not distinctly understood so.' 'It is false,' hastily interrupted the general; 'who did I speak to myself?' 'To me,' said the lieutenant. 'And did you say to the commandant that I had offered quarter?' 'No; I told him that you had refused us our lives, and we should both have perished there, only the smoke had grown intolerable: this is the truth, or you would not hold me here now.' The general beckoned with his hand for them to be removed. 'You will remember my father and brother?' said Lorenzo, imploringly. 'If I have done wrong they have served the king faithfully.' The whining tone in which this appeal was made contrasted unfavorably with the bold and frank demeanor of his fellow captive. 'If your father and brother had been taken,' said the general, 'your treason would have been no palliation of their loyalty.' The schoolmaster, I remember, held a paper cigar between his fingers (for at all times and seasons the Spaniards smoke), and was looking round for a light. *The general took his own cigar from his mouth and handed it to him to ignite his by; he bowed respectfully as he returned it to him.* 'Think on what I have said, general,' cried he as they were led away. It was evident that Zumalacarregui was strongly prepossessed in his favor; he gazed after him with that intense and penetrating look so peculiar to him, and muttered a few words, in which, 'What a pity for that lad!' alone was audible.'

Henningsen happened to be one of the officers of the watch that night, and he and his comrade had established themselves in the same house with these two unhappy men. Presently the father of the Christino Captain, old Ximenes, the most devoted of the Carlists, announced himself at the door.

'When I heard that Ximenes was come I could not help feeling a thrill of horror, and we were all about retiring, when the prisoners begged us to remain. The meeting—and the parting of the father, for the last time on this side of the grave, from a son,—who, however divided in opinions, and sinning in his political tenets, was still united to him in blood and in affections, which he in vain tried to control and to smother,—this was a heart-rending scene. Ximenes had sacrificed his fortune, and the ease and independence of his old age to his duty—and he now saw his eldest and once best beloved son, about to suffer death, with the consciousness that he had done his part to bring him to a punishment so bitter. He had resolved at first not to trust himself with an interview, but the prayer of his son, against whom all animosity was now buried, he had been unable to refuse. Ximenes, whom I have known much of both before and since, is a man who, although advanced in the vale of years, is still hale and healthy—short of stature, sharp featured, and gray haired; but I shall never forget when he entered the room, his son's throwing himself at his feet, and the expression of his countenance as the tears started to his eyes and rolled over his weather beaten cheeks; in an instant they were locked in each other's embrace; retiring into the alcove they conversed earnestly for some time, but not, from what I involuntarily gathered until the last, about the possibility of saving him. As the father took leave of him we heard him distinctly and earnestly say, 'Is there no hope, then?' '*Pide usted a Dios!*' 'You must pray for it to God!' replied the old man, as he tore himself away. When he was gone, we sent up the larger part of our supper to the prisoners, who had their rations, but which they could only get cooked soldier fashion. We had much conversation with them. The commandant seemed much more tranquil after this interview; and his lieutenant preserved the same sang-froid as at first. A day, or two days after, having been tried by the auditor of war, the prisoners were shot.

'I have often seen old Ximenes since. He still continues to serve us with the same zeal, and has been on many and dangerous expeditions, but he is visibly altered, and has always a settled gloom and melancholy in his countenance. I have heard that Lorenzo had offered him a large sum of money to gain him over; this had come to Zumalacarregui's knowledge, through the intelligences he kept up in the heart of the adverse party, and he had reproached Ximenes with not having informed him of it.'

* This is the French officer who has published a volume entitled 'The Career of Don Carlos,' and containing some very interesting chapters—especially one on Don Carlos's escape from London, and incognito journey through France to the seat of war. We have great doubts, however, whether Prince Talleyrand was not perfectly well aware of all that was going on. If Carlos be finally overthrown in Spain, nothing can prevent his resuming all his natural rights as First Prince (after the exiles at Prague) *of the House of Bourbon.*

New Iron Steamboat.—The wrought iron steamboat, ordered from England by the Steamboat Company of Georgia, arrived (in pieces) at Savannah, last week, on board the British ship Alcyone, Captain Muir from Liverpool. Her length is 120 feet, her beam 26 feet, and her depth 7½ feet. It is estimated by her builders that she will draw, with all her machinery and every thing on board, 9 feet 3 inches. She will have an engine of 46 English horse power, on the low pressure principle.

Rule for determining the weight of hay.—Hay in the field-rick, says Low, weighs somewhat better than 122 lbs. the cubic yard; after being compressed in the stack, it weighs from 140 to 180 lbs. and when old 200 lbs.

TO CONTRACTORS.

ENGINEER DEPARTMENT, BALTIMORE AND SUSQUEHANNA RAILROAD COMPANY,
April 25, 1836.

PROPOSALS will be received at this Office until the 10th May, for the gradustion and masonry of 20 miles of the Road, including a deep cut at the summit.

This division of the road commences in this State and ends in Pennsylvania; running through a high, healthy country, abounding in cheap provisions.

Satisfactory recommendations must accompany the proposals of those, who are unknown to the undersigned.

ISAAC TRIMBLE,
Chief Engineer.
WM. GIBBS McNEILL,
Consulting Eng.

15-tm10

HARTFORD AND NEW-HAVEN RAILROAD.

From New-Haven to Meriden, eighteen miles of this Railroad is now located, and is expected to be ready for contract about the 25th of May. The attention of contractors is invited to this work. A more definite advertisement of the time when proposals are to be received, will hereafter appear.

JAMES BREWSTER, Agent.

New-Haven, April 27, 1836. m16—3t

[Editors to whom this is MARKED, are repuested to give it three insertions, and send their bills to James Brewster, President Railroad Company,

PATENT RAILROAD, SHIP AND BOAT SPIKES.

☞ The Troy Iron and Nail Factory keeps constantly for sale a very extensive assortment of Wrought Spikes and Nails, from 3 to 10 inches, manufactured by the subscriber's Patent Machinery, which after five years successful operation, and now almost universal use in the United States, (as well as England, where the subscriber obtained a patent,) are found superior to any ever offered in market.

Railroad Companies may be supplied with Spikes having countersink heads suitable to the holes in iron rails, to any amount and on short notice. Almost all the Railroads now in progress in the United States are fastened with Spikes made at the above named factory—for which purpose they are found invaluable, as their adhesion is more than double any common spikes made by the hammer.

*** All orders directed to the Agent, Troy, N. Y., will be punctually attended to.

HENRY BURDEN, Agent.

Troy, N. Y., July, 1831.

*** Spikes are kept for sale, at factory prices, by I. & J. Townsend, Albany, and the principal Iron Merchants in Albany and Troy; J. I. Brower, 222 Water street, New-York; A. M. Jones, Philadelphia; T. Janviers, Baltimore; Degrand & Smith, Boston.

P. S.—Railroad Companies would do well to forward their orders as early as practicable, as the subscriber is desirous of extending the manufacturing so as to keep pace with the daily increasing demand for his Spikes.

1J23am H. BURDEN.

RAILROAD CAR WHEELS AND BOXES, AND OTHER RAILROAD CASTINGS.

Also, AXLES furnished and fitted to wheels complete at the Jefferson Cotton and Wool Machine Factory and Foundry, Paterson, N. J. All orders addressed to the subscribers at Paterson, or 60 Wall street, New-York, will be promptly attended to.

Also, CAR SPRINGS.

Also, Flange Tires, turned complete.

J8 ROGERS, KETCHUM & GROSVENOR.

NEW-YORK AND ERIE RAILROAD.

TO CONTRACTORS.—Proposals will be received at the Engineer's Office of the New-York and Erie Railroad Company, in the village of Binghampton, on and until the 30th day of June next, for grading 69 miles of the Railroad, from the village of Owego, in Tioga County, to the village of Deposit in Delaware County.

Proposals will also be received at the Engineer's Office, in Monticello, on and until the 11th day of July next, for grading 48 miles of the Railroad through the county of Sullivan, extending from the Delaware and Hudson Canal up the valley of the Neversink, and thence to the mouth of the Callikoon Creek, on the Delaware River.

Plans and profiles of the line above mentioned, staked out in convenient sections, with printed forms of the contracts, will be ready for exhibition at the said offices twenty days before the days of letting above specified.

The Company reserve the privilege of accepting only such proposals as they may deem for their advantage.

New-York, 26th April, 1836.

15—tf JAMES KING, President.

NOTICE TO CONTRACTORS FOR EXCAVATION AND EMBANKMENT.

PROPOSALS will be received at the Office of the Munroe Railroad Company, Macon, Geo., between the 19th and 21st of May next, for Excavating and Embanking the whole of the Railroad from Macon to Forsyth, a distance of 25 miles, embracing much heavy graduation.

For further information, apply to

DANIEL GRIFFIN,
Resident Engineer.
J. EDGAR THOMSON,
C. Engineer.

Macon, March 29th, 1836. 14—3t

CHICAGO LOTS.

NOTICE is hereby given, that on the 20th day of June next, at the Town of Chicago, in the State of Illinois, the following described Property will be sold at Public Auction, to wit:

All the unsold Town Lots in the original Town of Chicago; and also the Town Lots on fractional Section No. Fifteen, in the Township No. Thirty-nine, North of Range Fourteen, East of the Third principal Meridian adjoining the said Town of Chicago. The sale will commence on the said 20th day of June, and will be continued from day to day, until all the Property has been offered for sale or disposed of. This property is held by the State of Illinois for canal purposes, and is offered for sale in conformity to the provision of a Statute Law of the said State, authorizing such a sale. The terms of sale are one-fourth of the purchase money to be paid in advance at the time of sale, and the residue in three annual instalments, bearing an interest of six per centum per annum, payable annually in advance.

Those who are unacquainted with the situation of the above mentioned Property, are informed that those Lots which are described as belonging to the original Town of Chicago, are situated in the best built and business part of the Town. Section Fifteen is a dry ridge, commencing near the harbor, and extending south, one mile, along the shore of Lake Michigan.

By order of the Board of Commissioners of the Illinois and Michigan Canal.

Attest, JOEL MANNING,
Treasurer to said Board.

Chicago, March 17th, 1836. 13—8t

PROSPECTUS

OF VOLUME II. OF THE

CHICAGO AMERICAN,

TO BE PUBLISHED SEMI-WEEKLY.

In proposing to establish a SEMI-WEEKLY paper under the old title, but with extended dimensions, the subscriber acknowledges the favors of the past, and solicits the continued patronage of a liberal public.—The reasons that induced him about a year since to establish his weekly paper, operates with renewed and increasing force in favor of his present design.—He shall endeavor, as it was originally intended, to make his paper American in all things; and by identifying itself with the interests and circumstances of Chicago—which from a recent wildnerness has advanced to a population of thirty-five hundred—and of the rich, extensive, and rapidly developing country of which it is the emporium, he hopes it may "grow with their growth, and strengthen with their strength."

As a record of passing events, current literature, of the march of agriculture, commerce and manufactures, and especially of the progress of internal improvements, of which this State, by her recent passage of the act for the construction of the "Illinois and Michigan Canal," has commenced her great and auspicious system, it will aim, as ever, to be accurately and early informed, and thus endeavor to consult alike the tastes and wants of the community with which it is identified. With party, as generally understood, it will have as little to do as possible. Its politics will be the Constitution—its party, the Country.

With this brief explanation of its future course, and his thanks for the more than expected encouragement he has already received, the subscriber again ventures to solicit the continued patronage and extended support of all who may feel an interest in the principles here set forth.

It will be enlarged and otherwise greatly improved, and printed on superior paper, and forwarded to distant subscribers by the earliest mails, enveloped in a strong wrapper.

TERMS.—The AMERICAN will be published SEMI-WEEKLY, at $4 per annum, if paid at the time of subscribing; $5 if paid at the expiration of six months, or $6 if payment is delayed to the end of the year.

*** Any person procuring five subscribers and remitting the pay in advance, will be entitled to a sixth copy gratis, or a deduction of TEN PER CENT.

Persons at a distance remitting a $5 bill will receive the paper fifteen months.

*** All sums to the amount of $10 and upwards may be sent through the Post Office, at my expense.

THOS. O. DAVIS.

Chicago, March 25, 1836.

*** Subscriptions and Advertisements for the CHICAGO AMERICAN will be received at the Office of the Railroad Journal, 132 Nassau street, by

D. K. MINOR.

ALBANY EAGLE AIR FURNACE AND MACHINE SHOP.

WILLIAM V. MANY manufactures to order, IRON CASTINGS for Gearing Mills and Factories of every description.

ALSO—Steam Engines and Railroad Castings of every description.

The collection of Patterns for Machinery, is not equalled in the United States. 9—1y

GEORGIA RAILROAD & BANKING COMPANY'

NOTICE TO CONTRACTORS.

SEALED PROPOSALS will be received at this Office, between the 1st and 3d of June next, for laying the superstructure on 50 miles of the Georgia Railroad—all materials to be furnished by the Company.

The first ten miles to be commenced by the 10th of September, and completed by the 15th January next—the remainder of the line MUST BE finished on or before the 1st of May, 1837.

Plans and Specifications of the work, may be seen, and all other information obtained on application at the Office, one week previous to the letting.

J. EDGAR THOMSON, Chief Eng'r.

Engineer's Office, Augusta, Geo., April 2d, 1836. 12—4t.

STEPHENSON,

Builder of a superior style of Passenger Cars for Railroads.

No. 264 Elizabeth street, near Bleecker street, New-York.

RAILROAD COMPANIES would do well to examine these Cars; a specimen of which may be seen on that part of the New-York and Harlaem Railroad now in operation. J25tf

☞ THE NEWCASTLE MANUFACTURING COMPANY, incorporated by the State of Delaware, with a capital of 200,000 dollars, are prepared to execute in the first style and on liberal terms, at their extensive Finishing Shops and Foundries for Brass and Iron, situated in the town of Newcastle, Delaware, all orders for LOCOMOTIVE and other Steam Engines, and for CASTINGS of every description in Brass or Iron. RAILROAD WORK of all kinds finished in the best manner, and at the shortest notice.

Orders to be addressed to

MR. EDWARD A. G. YOUNG,
Superintendent, Newcastle, Delaware.

feb 20—ytf

AMES' CELEBRATED SHOVELS, SPADES, &c.

300 dozens Ames' superior back-strap Shovels
150 do do do plain do
150 do do do cast steel Shovels & Spades
150 do do Gold-mining Shovels
100 do do plated Spades
50 do do socket Shovels and Spades.

Together with Pick Axes, Churn Drills, and Crow Bars (steel pointed,) manufactured from Salisbury refined iron—for sale by the manufacturing agents,

WITHERELL, AMES & CO.
No. 2 Liberty street, New-York.
BACKUS, AMES & CO.
No. 8 State street, Albany.

N. B.—Also furnished to order, Shapes of every description, made from Salisbury refined Iron. 4—ytf

ARCHIMEDES WORKS.

(100 North Moor street, N. Y.)

NEW-YORK, February 12th, 1836.

THE undersigned begs leave to inform the proprietors of Railroads that they are prepared to furnish all kinds of Machinery for Railroads, Locomotive Engines of any size, Car Wheels, such as are now in successful operation on the Camden and Amboy Railroad, none of which have failed—Castings of all kinds, Wheels, Axles, and Boxes, furnished at shortest notice.

4—ytf H. R. DUNHAM & CO.

RAILWAY IRON.

95 tons of 1 inch by ½ inch.
200 do 1¼ do ½ do
40 do 1½ do ½ do
800 do 2 do ½ do
800 do 2½ do ½ do
soon expected.

FLAT BARS in lengths of 14 to 15 feet, counter sunk holes, ends cut at an angle of 45 degrees, with splicing plates and nails to suit.

250 do. of Edge Rails of 36 lbs. per yard, with the requisite chairs, keys, and pins.

Wrought Iron Rims of 30, 33, and 36 inches diameter for Wheels of Railway Cars, and of 60 inches diameter for Locomotive Wheels.

Axles of 2¼, 2½, 2¾, 3, 3¼, 3½, and 3¾ inches in diameter, for Railway Cars and Locomotives, of patent iron.

The above will be sold free of duty, to State Governments and Incorporated Governments, and the drawback taken in part payment.

A. & G. RALSTON,
9 South Front street, Philadelphia.

Models and samples of all the different kinds of Rails, Chairs, Pins, Wedges, Spikes, and Splicing Plates, in use both in this country and Great Britain, will be exhibited to those disposed to examine them.

4—d7 1mseowr